January 15, 1961 Vol. 138 No. 2

Journal

OF THE

AMERICAN VETERINARY MEDICAL ASSOCIATION

Infectious Bovine Rhinotracheitis

THIS STUDY indicates that IBR is a clinical entity which merits attention in range cattle. Page 59

Q Fever and Leptospirosis

A RESUME, prepared by the AVMA Council on Public Health and Regulatory Veterinary Medicine, on current information on these diseases. Page 64

Survey of AVMA Annual Meeting

A SUMMARY of the information supplied by convention registrants at the 97th Annual AVMA Meeting in Denver. Page 61

New AVMA Director of Public Information Appointed. Page 105



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CONTENTS

ARTICLES ON LARGE ANIMALS	59
Infectious Bovine Rhinotracheitis in Range Cattle of Colorado—T. L. Chow Q Fever and Leptospirosis—AVMA Council on Public Health and Regulatory	37
Veterinary Medicine	64
Penicillin in Milk Following Intramuscular and Intramammary Administration of Penicillin in Normal and Mastitic Cows—Albright—Ormiston	
—Brodie—Witter Genital Effects of Implanted and Oral Diethylstilbestrol on Heifers—	70
Reuber—Pearson—Pope The Incidence of African Swine Fever in Wart Hogs in Kenya—A Prelimi-	72
nary Report—DeTray—Zaphiro—Hay Interrelationship of Growth Rate, Hemoglobin Dilution, Packed Cell Volume, and the Incidence of Anemia in Suckling Pigs—Gehle—Payne—	78
Peo—Marsh	81
ARTICLES ON POULTRY	
Preparation and Use of an Autogenous Fowl Cholera Bacterin for Turkeys —Bierer—Vickers—Valentine	85
ARTICLES ON SMALL ANIMALS	
Canine Mammary Adenocarcinoma with Metastasis to Bone—A Case Re-	
port—Nims—Dean—Geil	87
Survey Evidence of Leptospira Infection in Iowa Dogs—J. L. Braun	90
Unusual Bullet Wound in a Dog—Case Report—J. O. Foss	93
Anemia in Hookworm-Infected Dogs—R. H. Cohen	94
An Unusual Case of Retained Pups and Pyometra in a Bitch—C. A. Hjerpe Hepatic Coccidiosis in Domestic Rabbits Treated with Nitrofuran Com-	97
pounds and Sulfaquinoxaline—Karl W. Hagen, Jr	99
GENERAL ARTICLE	
Survey of the 1960 Annual Meeting of the AVMA	61
EDITORIAL	
Pets or Companions?	101
Contents continued on adv. page 4	

Rongren, Advertising Manager; Eva G. Bailey, Production Manager and Assistant to the Editors.

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Years Leptospirosis in Cats . . Trichinosis in the United States 69 Udder Pox Treated Successfully Megacolon in Animals Protection from African Swine Fever Dec. 7, 1960 80 Lacking ... Dear Sir: Eperythrozoonosis in Cats 86 Referring to "What Is Your Diagnosis?" in the Rabies in Florida Cats 89 **JOURNALS Mailed Without Envelopes** November 15 JOURNAL, the removal of the nonfunc-Canine Eosinophilic Panositis tioning section of bowel is also used to correct megacolon in animals. The surgery is not especially difficult, is quite practical, and is done by veterinarifrom the RESEARCH JOURNAL Cartilaginous Tumors . 102 New Feline Viruses S/JACK O. KNOWLES, V.M.D. External Ear of the Cat Miami Beach, Fla. Studies on a New Feline Virus 103 **Ecologic Consideration in Turkey Orni-**103 Uterine Biopsy Technique 103 Melanoma in Scottish Terrier Parasite Survival on Pasture Dec. 12, 1960 Dear Sir: **NEW BOOKS** In regard to "What Is Your Diagnosis?" in Anatomy and Histology of the Eye and Orbit in Domestic Animals 104 the Nov. 1, 1960, JOURNAL, I would like to report Advances in Virus Research 104 a case of malignant melanoma in a 91/2-year-old, black, male Scottish Terrier. The dog was first brought to me in July, 1959, for a general check-up. FEATURES At this time, much tartar was scraped from the teeth Correspondence adv. p. and the last upper molar on the right side was ex-Report of Officers-Mark L. Morris adv. p. Exactly one year later, during another examination Washington News adv. p. 12 to determine the cause of halitosis, a friable, black, What Is Your Diagnosis? adv. p. 29 History of the AVMA adv. p. 34 foul-smelling growth was found to be intimately attached to the gum adjacent to the right upper Quiz for Quidnuncs adv. p. 38 When biopsy proved it to be a malignant melano-THE NEWS ma, the dog was euthanatized. Mr. Heinz R. Kuehn, New AVMA Direc-S/BURTON SAUNDERS, D.V.M. tor of Public Information Spring Valley Animal Hospital Special Training Program for Steroid Route 59, Monsey, N. Y. Biochemistry Veterinary School Enrollment and Fac-VETERINARY REVIEWS AND ANNOTATIONS Anatomists Meets (First issued 1955) Conference of Public Health Veteri-A half-yearly journal of reviews and narians Meets ... 223 annotations of important subjects of topi-Revised AVMA Council on Public Health cal interest written by specialists. Issued and Regulatory Veterinary Medicine in April and October, about 60 pages per American Veterinarians Serve on WHO Rabies Committee 224 Prepared by: Commonwealth Bureau of Dr. A. O. Foster to Direct Parasite Labo-Animal Health, Weybridge ratories, USDA 225 Annual Subscription-\$3.50 Dr. E. D. Leiby Retires ORDER through any bookseller or direct to: Dr. R. W. Boone Transferred 226 Among the States and Provinces 226

ITEMS

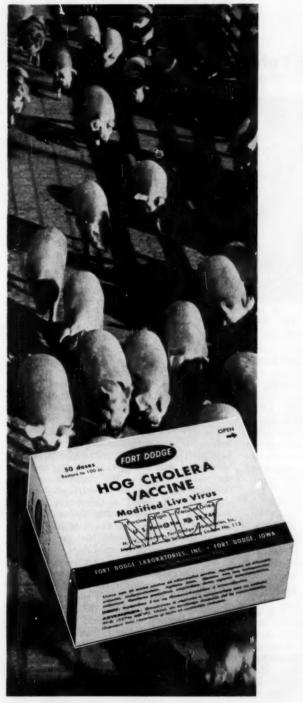
First Rabies Case in Washington in 7

State Board Examinations

Women's Auxiliary

227

227



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Professional and Public Information Programs

A recent headline in the A.M.A. NEWS read, "Public Image of M.D.'s Good and Getting Better." The news item states that the public image of physicians generally is good and seems to be getting better.

The question is this: Can we say the public image of the D.V.M. is good and getting better?

I am inclined to believe that such is the case. For example, 20 years ago there were few really well-constructed animal hospitals to serve the public. The general public, except for livestock owners, knew little about the veterinarian.

Granted, we have made progress in recent years through our professional and public information programs and, more importantly, through contacts of thousands of individual veterinarians with animal owners.

But have we scratched the surface? The impression I glean from talking with veterinarians is that the membership wants the AVMA's professional and public information program expanded and made more aggressive. Most veterinarians say, "Do something to improve the professional and public information program of the AVMA." This is a large but an essential assignment.

First, what is the current situation? The AVMA has had a public information program for a number of years. This program has been effective in many areas, particularly with the agricultural press, and has done much good for the veterinary profession. But it now needs re-evaluation, expansion, and expert professional direction.

The veterinary profession today is active in many areas; thus a public relations program must have a broad base so it can function effectively with a number of groups, such as the American Medical Association, the National Education Association, industrial associations representing the chemical industries, feed and food manufacturing and



Dr. Mark L. Morris, President-Elect

distributing associations, federal and state governmental agencies, and legislative bodies. There is need for an effective program of veterinary news dissemination to agricultural and research groups, to the various animal associations, to governmental agencies, and most certainly to the lay public.

Frequently overlooked and one of the most important is an intra-professional program designed to reach, within the veterinary profession, numerous satellite groups such as the industrial veterinarians, the American Animal Hospital

Association, the nutritionists, public health veterinarians, government and state regulatory officials, and many others. A program designed to more effectively interpret these various groups is one of the most urgent assignments. We must give attention to our own house and those living with us.

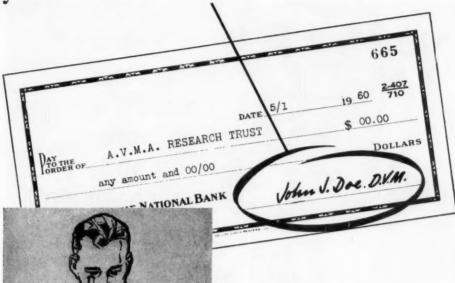
The over-all AVMA program can be no better than the program of each individual veterinarian and his program must be based upon good will and good service to and for the public. Together, the organization and the man can create an effective program.

The AVMA Board of Governors, in cooperation with personnel in the central office and consultants in the field of professional and public information, are actively studying this complex challenge.

We are developing a plan of action for setting up expanded professional and public information programs in the central office in Chicago and have chosen a new director of public information (see p. 105 of this issue). We are moving slowly and thoughtfully, with a long-range plan in mind that has the positive objective of creating permanent benefit to all.

Mark & Marie

your name here





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Weberlein, M.K., et al.: J.A.V.M.A. 134:518-519 (June 1) 1959.
 Nelson, A.J.: Vet. Med. 53:356, 1958. 3. Clifford, D.H.: J.A.V.M.A. 131:415 (Nov. 1) 1957. 4. Gradess, M.: Vet. Med. 51:587, 1956. 5. Krawitz, L.: Vet. Med. 52:442, 1957

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FROM THE AVMA WASHINGTON OFFICE
J. A. McCallam, VMD
Brig. Gen. USA (Ret.)

Self-employed Deferment Bill To Face Congress Self-employed tax deferment bill will be introduced in 87th Congress. Senator Smathers (D., Fla.), in co-sponsorship with Rep. Keogh (D., N.Y.), has about completed certain changes for early introduction of new bill.

Students May Apply for VC Duty Before Graduation

According to Brig. Gen. Russell McNellis, Assistant for Veterinary Services, Office Army Surgeon General, senior veterinary students may apply for appointment and active duty in the Army Veterinary Corps prior to receiving their professional degrees in the spring of 1961. Those whose applications are approved will receive reserve commissions on the day of graduation and will be called to active duty as required in 1961-62, some probably as early as July-August, 1961, and others in January, 1962.

USDA 1960 Research Report Available USDA summary of research advances during 1960 stated new findings may lead to more efficient and profitable crop and livestock production. Among items included in the four-page release are studies on poultry cancer, breeding chickens resistant to an infectious-like cancer of bone and marrow, and work at Plum Island Laboratory on the ribonuelic-acid core of foot-and-mouth disease. This release may be obtained by writing Department of Agriculture, Information Office, Wushington 25, D.C., citing USDA 3567-60.

Foot-and-Mouth Disease Reported in Sweden USDA announced on Dec. 9, 1960, an epizootic of footand-mouth disease in Sweden. A number of protective measures required by the Act of June 17, 1930, were placed into effect by the United States.

USDA Dairy Committee Makes Recommendations Among several recommendations made by the USDA Dairy Research and Marketing Advisory Committee at its annual meeting in Washington, Dec. 6 through 8, were development of rapid screening tests for traces of pesticide residues in milk, and development of increased knowledge about mastitis. It advised new or expanded studies on (1) characteristics of disease-producing agents, (2) diagnostic methods, (3) immunizing products, (4) possible medicinal treatments, and (5) how the disease spreads.

(continued on adv. p. 14)



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Washington News-continued

Agreement Reached on Research South of Rio Grande

Public Health Service and Pan American Health Organization have reached an agreement relative to the jurisdiction over medical research south of the Rio Grande. P.H.S. will give technical advice in research planning and consider applications for research grants conducted or coordinated by P.A.H.O. The conduct of intermural research, coordination of projects involving two or more countries, assistance in development of manpower and scientific communication, and some financial aid to certain programs will be that of P.A.H.O.

Wickersham Officially Elected in Oklahoma Victor Wickersham (D., Okla.), has been officially certified to represent 6th Congressional district. This has been an on-again, off-again affair since November 8; one announcement had Clyde Wheeler (R) elected by a 600-vote margin. Mr. Wickersham was declared victor by somewhat less than 100 votes.

Article for Research and Graduate Education Published An article of interest to some in the fields of research and graduate education will be found in Science, Dec. 16, 1960, Vol. 132, No. 3442. The title is "Scientific Progress and the Federal Government."

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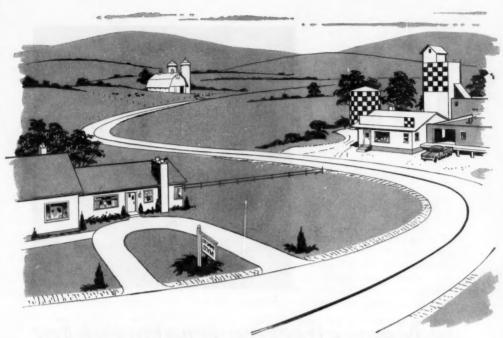
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1. Vigue, R. F., et al.: J. Am. Vet. M. Ass. 134:308 (April 1) 1959.

2. Vigue, R. F.: Personal communication.

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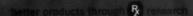
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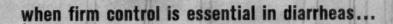
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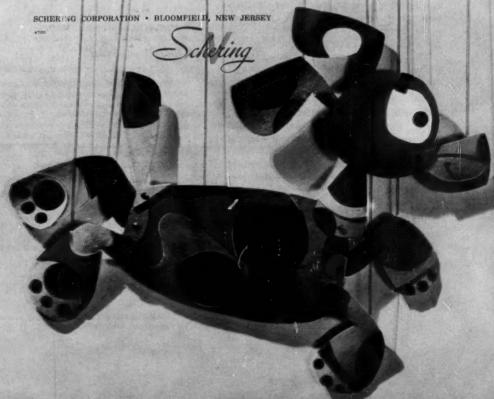
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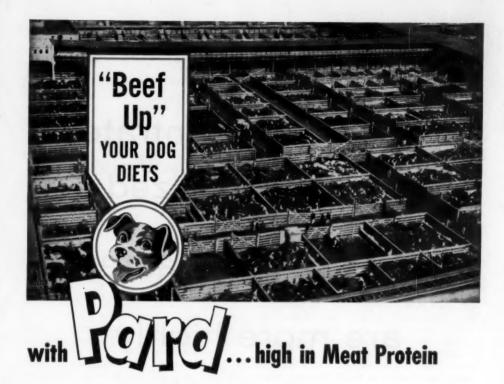


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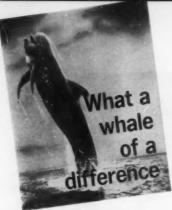
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AMERICAN VETERINARY
MEDICAL ASSOCIATION

Infectious Bovine Rhinotracheitis

in Range Cattle of Colorado

T. L. CHOW, B.V.S. PH.D.

INFECTIOUS bovine rhinotracheitis (IBR), an acute, contagious disease of cattle, is characterized by fever, rhinitis, and tracheitis. Since 1950, when the disease was first identified and described, it has been observed repeatedly, often in epizootic proportions in cattle being fattened in feedlots, and in dairy cattle.3 So far as can be determined, the disease has not been reported as a clinical entity in range cattle. In experimentation, all types of cattle were susceptible,1,2 and the process of fattening did not significantly increase susceptibility. Rational explanations for the limitation of the disease to feedlot and dairy cattle have not been advanced. This study indicates that IBR is a clinical entity which merits veterinary medical attention in range cattle. The virus of IBR was isolated from 1 herd which was affected with a respiratory disease. In another study, specific antibodies against the disease were identified in a survey of serums from range cattle of Colorado.

Isolation of IBR Virus from an Occurrence of Disease.—A respiratory disease was observed in each of 2 herds of range cattle in the mountainous areas of Larimer County, Colorado. One herd contained 16

cattle approximately 3 months old. Of these, 4 were affected. The second herd contained 42 cattle approximately 3 months old, and 2 were affected. Clinical signs of affected cattle of both herds were similar. Body temperatures ranged from 104.5 to 106.4 F. Anorexia, weakness, and incoordination were prominent signs. Respiration rates were increased, and expiratory dyspnea generated tracheal sounds, with occasional coughing. Neither pneumonia nor diphtheria developed. Hematologic values were within normal limits. Bacterial cultures of blood were negative. Nasal washings and serums from affected cattle, inoculated into mice and chicken embryos through 5 blind passages, were negative. However, a cytopathogenic virus was isolated in the monolayer bovine kidney cell culture. The virus was neutralized by known antibodies of infectious bovine rhinotracheitis. The virus was inoculated intratracheally into a normal calf which did not have an antibody titer against IBR. The inoculated calf developed clinical signs which were typical of IBR. After the calf's recovery, its serum contained a high titer of antibodies against the virus of IBR.

Antibodies in Range Cattle.—From 42 Colorado counties where IBR had not been diagnosed, 1,340 serum samples from 134 herds of range cattle, with 10 random samples per herd, were obtained. The serums were tested for antibodies. Results are given (table 1).

From the College of Veterinary Medicine and Agricultural Experiment Station, Colorado State University, Fort Collins.

This study was supported in part by the Animal Disease and Parasite Research Branch, USDA, Agricultural Research Service.

The author thanks Dr. T. E. Traylor of the State-Federal Brucellosis Laboratory, Denver, Dr. L. M. Holland, Dr. W. A. Aanes, and Mrs. E. J. Stoddard.

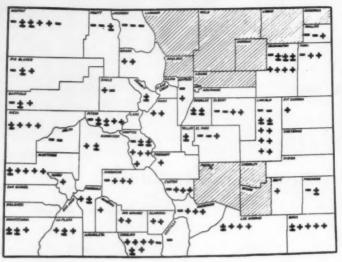


Fig. 1—Serologic survey of infectious bovine rhinotracheitis (IBR) in range cattle in Colorado. Hatched area: natural occurrences of IBR in feedlot and dairy cattle; clean area: no IBR reported, serum samples of range cattle were studied.

+Herd had serums containing IBR antibodies;—herd had no serums containing IBR antibodies; ±herd had serums in which presence of IBR antibodies was not determined.

Of the 42 counties surveyed, 34 contained range cattle with antibody titers against IBR. The distribution of tested herds in counties is shown (fig. 1).

Discussion

Previous failures to diagnose IBR in range cattle may have resulted from a com-

TABLE 1—Survey of Range Countles for IBR in Serum Samples

	Serum-neutralization index
Counties, total42	
Counties, positive34	>50
Counties, negative 3	<32
Counties, doubtful 5	32 to 50

bination of several factors. Range cattle commonly are widely distributed in large pastures. Under these conditions, owners have had little opportunity to observe cattle for sickness. Clinical signs of this disease closely resemble signs of other respiratory diseases, such as shipping fever and calf diphtheria, Actual occurrences of IBR may have been diagnosed erroneously. Clinical signs may have been sufficiently mild to preclude requesting the attention of a veterinarian.

Range counties in Colorado are located both on the east and the west sides of the Continental Divide. Antibodies for IBR were found in range cattle equally on both sides of the Continental Divide, although feedlots where the disease has been epizootic are concentrated in counties east of the mountains. The wide distribution throughout range counties suggests that the disease may occur in range cattle in states surrounding Colorado and possibly over much wider geographic areas.

In 3 range counties, Jackson, Delta, and Costilla, IBR-positive serums were not found. Only 1 herd from Costilla County was tested, whereas 2 herds from Delta County and 3 herds from Jackson County were tested. These negative results may be due to the relatively small number of samples taken in each of these counties.

Summary

The virus of infectious bovine rhinotracheitis (IBR) was isolated from sick range cattle in the mountainous part of Colorado. Specific antibodies against IBR were found in serums of cattle widely distributed geographically in range counties on the east and west sides of the Continental Divide.

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Survey of the

1960 Annual Meeting of the AVMA

ON AUG. 14-18, 1960, the American Veterinary Medical Association held its ninety-seventh annual meeting in Denver, Colo. On September 1, one thousand survey questionnaires were mailed to a representative cross section of veterinarians who attended. Although total registration was 5,009, many of those registered were not veterinarians. Throughout this report, the term "registrants" will be used to refer only to veterinarians.

Registrants at the Convention

At registration, the veterinarians were asked to indicate their present professional activity. Those in practice outnumbered those in other pursuits by about 2 to 1.

The location of the convention suggested that more of the practitioners attending would be interested primarily in large rather than small animals, and this was

TABLE 1—Present Professional Activity of Veterinarians Attending 1960 Annual Meeting

In practice:		63%
Exclusively (over 95 %) large animal	11	
Primarily (75 to 95 %) large animal	23	
About even, large and small animal	12	
Primarily (75 to 95 % small animal	6	
Exclusively (over 95 %) small animal	11	
Not in practice:		37%
Research and teaching	18	
Regulatory and inspection	8	
Marketing and manufacturing	4	
Others (mostly otherwise unclassified n	nilitary) 7	
Total		100%

true (40 to 23%). However, of those attending who were in practice, only one third lived within 500 miles of Denver.

Survey Among Registrants

The information in this report is based upon the 434 usable replies from the 1,000 questionnaires which were returned in the first 3 weeks after mailing. In all professional classifications, the percentage of the returns used closely approximates that of the actual registration.

Attendance Last Year

Generally, about 40 per cent of those in practice and about 70 per cent of those engaged in other professional activities had attended the previous year's meeting in

Fourteen section officers from 6 states held their first program meeting in Chicago on Oct. 25, 1960. They have studied detailed reports of this Denver meeting survey and, wherever practicable, will consider the preferences of the respondents in planning the scientific program of the 1961 meeting.

Kansas City. There were no significant differences among the subgroups with the exception of those engaged in Marketing and Manufacturing, who scored a 93 per cent attendance last year. Since many of these were exhibitors, this high figure was not unexpected.

Among those who did not attend last year, expense was perhaps the most important reason, although location, month of year, and colleague's turn to go were also important.

There is some correlation between "geographic location" and "expense" (although some simply cited a dislike for Kansas City and its August climate) but little can be done to overcome either of these factors.

Frequency of Attendance

The policy of holding the convention in a different city each year undoubtedly is valuable in making its facilities available to a greater number of practitioners since 42

TABLE 2—Reasons for Nonattendance at Kansas City in August, 1959; Per Cent of All Mentions

	In practice	Not in practice	All
Expense	22	33	25
Geographic location	22	14	19
Month of year	16	11	15
Colleague's rurn	12	1.1	12
Too busy	10	6	9
Other	15	14	15

per cent of them had not (within the last 5 years) attended any of the annual meetings. (There was no significant difference between those in large animal, mixed, or small animal practice.)

TABLE 3—Annual Meetings Attended in the Last 5 Years; Per Cent of All Registrants

3 Tears; Per Cent of All Registrants						
		In practice	Not in practice	All		
None		42	18	33		
At least 1		31	23	28		
At least 2		10	19	14		
3 or more		17	40	25		
		100%	100%	100%		

Among all of those who are not in practice, only 18 per cent had not attended any meeting during the same period and, among those men in Research and Teaching, who comprise the largest segment of this group, only 11 per cent had not attended.

The Scientific Sessions in Retrospect

Material.—Generally, most registrants believed that the subject matter was well selected and that most of the presentations they heard were good.

Criticism of Presentations.—The most prominent shortcoming, checked by about half of the respondents, was "too little new data."

Other criticisms appeared to be of much less importance, but the comment that material was "too technical" was checked by a greater percentage of nonpractitioners than practitioners.

Outstanding or Useful Presentations.—
The presentations most frequently acclaimed by all registrants as most outstanding or useful were (in order of preference) the Symposium on Hindlimb Problems (in whole or in part); the panel, Can You Defend Your Choice of Canine Distemper Vaccines?; Blood Disorders of the Cat (Holzworth); Recent Advances in Veterinary Surgery (Markowitz); and the TV panel, Lameness of Horses.

Although TV, films, and panels were well received and certainly aid and diversify the program, half of the mentions for outstanding or most useful presentations were for those that were accorded regular delivery.

These variations—TV, panels, films—accounted for almost one quarter of all presentations this year and, although there is nothing in the over-all results to indicate a definite need to further increase their number, the fact that 8 of the 12 top presentations cited by all respondents as outstanding or useful incorporated one or more of them may be some indication of their popularity.

Respondents were fairly evenly divided on several suggestions presented to them

TABLE 4—Types of Presentations Cited as Most Interesting and Useful; Per Cent of All Mentions

interesting	and	Useful;	Per	Cent	of	All	Mentions
Regular deliv	very			-			50
Television (a	alone)						19
Panels (alon-	e)						11
TV-film (con	mbina	tion)					9
Films							7
TV-panel (c	ombin	ation)					4
							100%

for planning future half-day sessions at the convention. The first was that of using one theme (as was tried with the canine hindlimb problems), as opposed to discussing several varied subjects (as is usually done). Despite the equality of the responses, the apparent popularity of the

TABLE 5—Comments on "High Points" of Convention in Terms of Personal Interests; Per Cent of

Mentions				
Social events/visiting with colleagues	40			
Specific sessions or papers	25			
Exhibits	8			
Program organization	6			
Committee or other associated meetings	6			
Television presentations	5			
Convention city	3			
Other miscellaneous	7			

Symposium on Hindlimb Problems should sway the balance in favor of more of the former. The second pertained to a limit of 3 or 4 reports per session with more time for questions, as opposed to offering many reports with little or no time for questions by the audience. There was a slight preference for the former which could be reinforced by the criticism of lack of time for questions.

Topics for Future Meetings

Over 10 per cent of the registrants would like to hear more discussions on veterinary practice ethics and economics (particularly fees and collections) at forthcoming conventions. Among other topics mentioned were surgery (particularly topics relating to large animal surgery and new surgical techniques); dermatologic problems (particularly canine dermatoses); swine problems (diseases, specific pathogen-free pigs, management); and laboratory techniques and equipment (especially radiology).

Exhibits

Although more interest in scientific exhibits was apparent among nonpractitioners, 64 per cent of all the registrants looked at "most" of them. Sixteen per cent visited about half, and the remaining 20 per cent, only a few or, in some cases, none.

More of the registrants, 84 per cent looked at "most" of the commercial exhibits than had looked at "most" of the scientific exhibits. Thirty-eight per cent reported 1 or 2 that they considered particularly outstanding.

High Points

Respondents were asked to name the "high points" of the convention in terms of their personal interests. Socializing appeared to be more important than anything else.

Conclusions

Judging from the survey responses and commendatory letters received, the annual meeting at Denver was well accepted by a decided majority of those attending. Consideration of the survey data and miscellaneous comments, however, may enable the planners to make next year's Detroit meeting even better.

Partly because of comments on the questionnaires, the AVMA central office staff is already studying the possibilities for advance registration at the next meeting. The Executive Board, hoping to provide an acceptable substitute for the commercially sponsored, open house-type of hospitality suite that was prohibited at the Denver meeting, has approved tentative plans to provide for friendship areas where conventioneers can meet and visit with friends and obtain refreshments.

First Rabies Case in Washington in 7 Years

The first case of animal rabies in the State of Washington since 1953 was reported recently. The animal was a 5½-year-old dog which had been vaccinated against rabies on July 18, 1960, in California. On July 25, a slight lameness in the right rear leg was observed. The next day, the dog was taken on a trip through the Northwest. On July 29 and August 1, the dog was examined by 2 different veterinarians in Idaho for paralysis in the hind-quarters. Later, on August 1, the dog had definite signs of encephalomyelitis and was brought to the Washington State University veterinary clinic. The dog died on the night of August 3.

Microscopic examination of brain tissue revealed an inclusion body and mouse-inoculation tests for rabies were positive. A student employed at the veterinary clinic was bitten by the dog. All persons who had had contact with the dog were given anti-rabies injections.

Investigation in California revealed that the dog had received a severe laceration on his hip 2 to 3 months previously. This was thought to have resulted from a fight with another animal.—Morbid. and Mortal. Rep., PHS, 9, (Sept. 9, 1960): 2.

COUNCIL REPORT AYMA Council on Public Health and Regulatory Veterinary Medicine

Q Fever and Leptospirosis

A special project of the AVMA Council on Public Health and Regulatory Medicine is the development of statements pertaining to animal diseases currently confronting all veterinarians, but especially workers in the fields represented by this Council. Consideration will be given both to diseases that are economically important to the livestock producers and to human health and to diseases that are not especially significant from an economic standpoint but are important because of their impact on human health. Leptospirosis and Q fever were the first diseases selected by the Council for this special consideration.

The accompanying resume on current information is intended to be a quick reference for all veterinarians who are confronted with questions pertaining to Q fever and leptospirosis. The material is not intended to be comprehensive or detailed. Rather, it is a condensation of much available information. It is hoped that it will be especially helpful as a ready reference for those who sometimes need such concise material but have insufficient time to make a thorough review of the literature.

From time to time, the Council's Disease Review Committee (E. S. Tierkel, Chm., C. D. Van Houweling, K. F. Wells) will prepare similar statements on other current disease problems.

Q Fever

The causative agent of Q fever is *Coxiella burnetii* (*Rickettsia burnetii*). Infected domestic livestock (cattle, sheep, and goats) and their products or environments provide the known sources of infection.

Clinical Signs in Man.—Q fever is characterized by sudden onset, chills, retrobulbar headache, fever, weakness, malaise, severe sweating, and great variation in severity and duration. An atypical pneumonia may occur along with mild cough, scanty expectoration, chest pain, minimal physical findings, and little or no upper respiratory involvement. Chronic infections and sequellae have been reported. The fatality rate before the use of antibiotic therapy was not more than 1 per cent; it is now negligible except in aged persons.

Clinical Signs in Animals.—Completely asymptomatic infections occur among cattle, sheep, and goats in the United States. Infection does not affect milk production nor does it produce abortions. It can be detected only by laboratory test procedures.

Laboratory Diagnosis.—Laboratory diagnosis is usually necessary to confirm

clinical diagnosis in man or to detect infected animals. It is dependent upon the presence of antibody in milk or serum, demonstrated of a rising antibody titer, or upon the isolation of the causative agent from blood or milk specimens.

- 1) Capillary Agglutination Test.—This test can be used on milk specimens and on animal and human serums. It is simple and practical and can be done readily in any veterinary public health program activity.
- 2) Complement-Fixation Test.—A most useful test on serums which can be performed on milk but results in lower titers.
- 3) Rickettsial Isolation.—Recovery of C. burnetti from blood or milk by inoculation of guinea pigs or hamsters is time-consuming, expensive, and hazardous to laboratory personnel.

Epidemiologic Features

Occurrence.—Q fever is world-wide in distribution. The naturally occurring infection of domestic livestock is more wide-spread among animals in the United States and Canada than is generally recognized.

It was found to be present in dairy cattle of all 43 states included in a recent survey. The prevalence of infection among sheep has not been adequately studied.

The disease constitutes a considerable public health problem, occurring in endemic or epidemic form. The disease has been reported from several western states in recent years. Human cases result from exposure to or residence near contaminated premises and infected animals or from the household use of raw milk. The public health significance of Q fever remains to be studied and determined throughout most of the newly recognized infected areas of the United States and Canada.

Transmission .- Man and lower animals contract infection commonly by inhalation of air-borne rickettsiae disseminated from the reservoir of Q fever in infected livestock. Extensive contamination of environments occur from the rickettsiae expelled in infected fetal membranes and fluids discharged at parturition by cattle, sheep, and goats. The membranes may contain as many as 1 billion guinea pig infectious doses per gram of material, and the agent becomes disseminated as the membranes and fluid desiccate and disintegrate. Investigators have found sheep fetal membranes responsible for environmental contamination during and after lambing season, which coincides with the seasonal incidence of human cases in sheep raising. The Q fever organism is highly resistant to the adversities of the atmosphere and tends to spread by readily infecting other animals or man. Spread occurs through movement of infected animals between adjacent premises, or even to isolated herds by undefined routes.

Raw milk from infected cows may be responsible for some human cases. The disease may be also contracted by direct contact with intected animals or with other contaminated materials.

Dairy cattle and sheep are highly susceptible to natural infection. In 1 study, 45 per cent of the susceptible cows introduced into an infected herd developed evidence of infection within 6 months; the exposure of susceptible sheep resulted in a 26 per cent infection rate. Beef animals are less frequently infected, probably because differences in herd management practices result in less opportunity for intraherd dissemination. In dairy cows, the agent localizes in the gravid uterus or in the lactating mam-

mary gland. Only serologically positive cows shed organisms in milk or fetal membranes, especially during the first few parturitions following infection. Approximately 50 per cent of the serologically positive cows shed small quantities (10 to 1,000 guinea pig infective doses per ml.) of rickettsiae in their milk; half of these animals develop chronic infections and continue to excrete the agent. Once infected, the majority of herds remain permanently infected.

Other Characteristics.—The incubation period in man is usually 2 to 3 weeks. Under natural conditions, direct transmission from man to man is negligible. Susceptibility of man and lower animals is of a high order, and an attack confers immunity for at least 1 year.

An unusual feature of this disease is the completely asymptomatic infection in cattle, sheep, and goats without deleterious effect upon their well-being or productivity. Its occurrence and spread among animals and its ability to cause disease in man emphasizes the need for more definitive studies of this infection and for the development of methods for its control. In the light of our present knowledge, control of the human Q fever problem can be achieved only through control of the infection in animals.

Control Measures

Vaccination of man with inactivated vaccines prepared from *C. burnetii*-infected yolk sacs is effective in protecting laboratory workers or others in high risk groups. Skin testing prior to vaccination will reveal sensitized persons in whom vaccination may cause severe localized reaction.

Health education programs should include information on the occurrence and the sources of Q fever and the necessity of pasteurization of milk and adequate disposal of animal fetal membranes or wastes,

Pasteurization of milk from cows, sheep, and goats at 69.9 C. (145 F.) for 30 minutes, or at 71.7 C. (161 F.) for 15 seconds by the high-temperature, short-time method, or boiling of milk, inactivates the rickettsiae.

Specific treatment of human beings involves oral administration of tetracycline and chloramphenicol for several days after the patient becomes afebrile. Treatment should be reinstituted if relapse occurs.

Sources of infection and contacts should be investigated by determining the occurrence of foci infection among animals and by searching for occupational exposure, contact with livestock, consumption of raw milk, or association with other infected environments.

In the attempt to control animal infections, vaccines should be used, where indicated, to prevent spread within a herd or to other herds. Control of movement of infected animals can be expected to minimize the spread of Q fever into infection-free areas, but will have to be supplemented with other measures.

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Leptospirosis

This disease represents a group of acute systemic infections found in lower animals and transmitted to man under natural conditions.

Causative Agents.—Many serotypes of the genus Leptospira, Leptospira icterohaemorrhagiae, Leptospira canicola, Leptospira autumnalis, and Leptospira pomona, have been recovered from man in the United States; others are probable. At present, at least 60 serotypes are recognized.

Clinical Signs in Man.—Clinical signs in man include elevated body temperature, headache, chills, severe malaise, vomiting, muscular aches, meningeal irritation, and conjunctivitis; infrequently, jaundice, renal insufficiency, hemolytic anemia, and hemorrhage in skin and mucous membranes occur. The acute illness lasts from 1 to 3 weeks; relapses may occur. Fatality is low, but it increases with advancing age and may reach 20 per cent or more in severe cases. Synonyms are Weil's disease, canicola fever, swineherd disease, mud fever, hemorrhagic jaundice, Fort Bragg fever, rice field fever, and cane field fever.

Clinical Signs in Animals.—In cattle, an acute, often fatal disease characterized by hemorrhage, hemoglobinuria, and icterus. Nonfatal infections are often characterized by fever, anemia, abortions, sterility, decreased lactation, and mastitis. Organisms may be shed in urine of recovered animals and of apparently healthy carriers.

In swine, abortion, stillbirths, and apparently healthy shedders are principal characteristics.

In horses, clinical signs are elevated body temperature, anorexia, and localization in eyes giving rise to recurrent iridocyclitis (periodic ophthalmia).

In dogs, elevated body temperature, anorexia, anemia, icterus, uremia, and occasionally hemorrhage are the clinical signs. Infection in dogs frequently may be inapparent.

Laboratory Tests:

- 1) Microscopic agglutination test with live antigen (agglutination "lysis").—Cumbersome, time-consuming. Specific for determining serotype involved when isolates are available.
- Macroscopic agglutination tests.—Several are available. Rapid and valuable for screening. Will not identify the serotype involved.
- Complement-fixation test.—Difficult to obtain reproducible results. Has not proved practicable.
- Hemolytic test.—Works well with human serums. Has not been evaluated thoroughly on animal serums.
 - 5) Direct culture methods.—Either blood

from large or small animals or urine collected from small animals by bladder tap may be inoculated directly into semisolid medium. Voided urine from large animals is diluted in buffered saline solution and then cultured.

Epidemiologic Features

Occurrence.—Leptospirosis was formerly thought to be a sporadic disease of dogs, but it is now being increasingly recognized as a major infectious disease of livestock, particularly cattle. Epizootics have caused abortions, high mortality, and losses from decreased milk production and sterility. It is being reported from all parts of the country.

The disease in man occurs in swimmers exposed to waters contaminated by infected animals. It is an occupational hazard to rice field workers, farmers, sewer workers, miners, veterinarians, animal husbandrymen, abattoir workers, and those who work in rat-infested premises. Distribution of animal reservoirs and of various leptospiral serotypes is world-wide.

Transmission.—Transmission of leptospirosis within lower animal populations and from animals to man depends upon elimination of the leptospires in the urine of infected animals. This is probably most often accomplished by the contamination of water, although some transmission may occur by droplet inhalation of highly infected urine that is splattered when voided. The organism is highly invasive, particularly through mucous membranes and through abraded skin and epidermal tissue softened by soaking in water. Ingestion of the organism probably plays a role in the infection of livestock watered in contaminated streams and pools.

Sources of human infection include cattle, dogs, and swine, as well as rats and other rodents. Wild animals such as foxes, skunks, raccoons, and opossums may also provide an important source of infection for both man and domestic animals. Certain species of water birds have been reported as carriers. Transmission to man results from contact with urine or tissues of infected animals. Direct contact may occur when people handle the tissues of infected animals. Indirect contact occurs when the organisms are excreted in water or moist soil and people are exposed while swimming, working, or accidentally im-

mersed in the contaminated environment. Infection occurs by penetration of the organisms through mucous membranes (conjunctiva is an important point of entry) or abraded skin.

An important factor in transmission is the ability of recovered or asymptomatic animals to continue shedding leptospires in urine for 6 months or longer.

Other Characteristics.—Susceptibility of various serotypes varies in different hosts. Leptospira pomona is most often reported from cattle, swine, and horses. Rats and wild rodents are most often identified with L. icterohaemorrhagiae; dogs, with L. Canicola and L. icterohemorrhagiae. There is increasing evidence of cross-infections with various serotypes occurring in many different species. Man's susceptibility to all these serotypes is general under natural conditions. The incubation period is 4 to 19 days.

Control Methods

1) Vaccination (dominant local strains) and antibiotic therapy of domestic animals.

2) Hygienic farm practices; segregation of infected herds.

3) Rodent control.

4) Avoidance of the use of potentially contaminated waters for swimming by man or for watering susceptible livestock.
 5) Drainage of wet, muddy farms.

Use of gloves, boots, and other protective clothing for workers in occupations

of high risk.

7) Treatment of man: Penicillin, streptomycin, and tetracycline are leptospirocidal *in vitro* but results of treatment trials have been variable.

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Leptospirosis in Cats

On examination of 358 cats in Leningrad, Russia, for agglutinins to Leptospira canicola and Leptospira isterohaemorrhagiae, only 1 reactor was found. On examination of 30 cats in Vladivostok, using 11 antigens, 1 reacted to Leptospira grippotyphosa and 1 to L. canicola. Leptospira grippotyphosa was isolated from the kidneys of a wildcat that reacted with a titer of 1:100.—J. Microbiol., Moscow, 31, (1960): 140-141; abstr. in Vet. Bull., 30, (Sept., 1960): item 2824.

Trichinosis in the United States

Knowledge of the occurrence of trichinae in pigs in the United States originally stemmed from the data that were accumulated between 1892 and 1906, in the course of routine microscopic inspection of pork intended for export to Europe. At that time, from 1.5 to 2.5 per cent of several million pigs so inspected were found to harbor trichinae. Information on thousands of pigs, accumulated in the 1930's, indicated a comparative infection rate in farm-raised pigs of about one-fifth of that reported in the earlier years. A decade or more later, a more limited survey indicated a further decline in the frequency of trichinosis in swine to about 0.2 per cent.

In garbage-fed pigs, the frequency of trichinosis was several times higher than in farm-raised pigs. Trichinosis began to decline, however, beginning in 1944 when the cooking of garbage to be used as swine feed first became mandatory in some states in order to halt the spread of vesicular exanthema. The present overall incidence of trichinae in swine that are fed cooked garbage is somewhere between 1 and 2 per cent in areas where it was about 5 times higher when garbage was not cooked.

Along with the decrease in the extent and degree of infection in swine fed cooked garbage, there has been a steady decrease in the prevalence of human trichinosis in this country. The total number of human trichinosis cases reported by the U. S. Public Health Service for 1957 was 178, whereas in previous years that number was double or higher.—Benjamin Schwartz, Consultant in Parasitology, Meat Inspection Division, ARS, USDA, at First International Conf. on Trichinosis in Warsaw, Poland, Sept. 12-13, 1960.

Penicillin in Milk

Following Intramuscular and Intramammary Administration
of Penicillin in Normal and Mastitic Cows

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DATA CONCERNING the presence of antibiotics in milk following intramuscular and intramammary administration in the same cow is inadequate. As a result, a study to determine the presence of penicillin in the milk of cows treated by udder infusion and by intramuscular injection of penicillin was made in the University of Illinois dairy herd.

Materials and Methods

The experimental subjects were 2 cows with mastitis and 6 normal cows, as determined by strip cup. California Mastitis Test, direct microscopic examination (leukocytes and identification of bacteria), standard plate counts, and examination for clinical signs. The cows were in various stages of lactation. The production of these cows averaged 38 lb. of milk per day with a range of 20 to 50 lb.

Immediately following the milking preceding the testing period, cows were each given 6,000,000 units of procaine penicillin G in oil suspension in the musculature of the rump region. Two weeks later, the cows were each given 5,000 units/lb. of body weight in the same manner.

Fourteen days after penicillin was given the second time, 100,000 units of procaine penicillin G in oil suspension was infused into the right rear quarter of each cow, and 14 days later 100,000 units of procaine penicillin G in aqueous suspension was infused into the right rear quarter of each.

Milk samples were collected from the complete yield of each quarter by the use of an individual quarter milker. The cows were milked twice a day at regular milking intervals until the milk was essentially antibiotic-free (96 hours post-treatment). The Food and Drug Administration approved modified disc assay method for detecting antibiotics in milk with *Bacillus subtilis* as the test organism was used.² Penase discs were used to determine penicillin activity and to detect the presence of interfering antibacterial-like materials.

Results and Discussion

The results of this investigation are tabulated (table 1). None of the pretreatment samples of milk from cows treated intramuscularly and by intramammary

TABLE 1—The Presence of Pencillin in Milk Following the Administration of Procaine Penicillin G

			Ho	ars 1	posta	dminis	tratio	n	
Cow No.	0	12	24	36	48	60	72	74	96
By intramuscu suspension) or									
sion)*									
1249**	-+								_
1611**			-			-	_		_
1452				_		-		-	-
1608					-		_	-	_
1620					-	-	-	-	
1650			-				_	-	-
		-	-	****	_		_		Name of Street
1487		District.			****	E-10.	10.00	ACCOUNT.	***
1624		-		-	Minne.	-	****	-	-
By intramamn	nary	infu	sion	with	100	,000 ε	nits/	cow	(oil
1249**	-	+±	+	+	+	+	+	4	+
1611**	-	+	+	4	+	+	4-	+	+
1452	book.	+	+	+	+	+	+	-	-
1608	-	+	+	+	+	+	+	****	-
1620	_	-	+	+	+	and an	4	+	9000
1650	-	+	+	+	4	+	+	+	+
1487	-	+	+	+	+	+	+	+	+
1624	-	+	+	+	4	+		-	-
By intramam							20	-1	
(aqueous suspen			usion	. 44	1619	100,00)U U	11113/	COM
	131011								
1249**	-	+	+	+	_	_	-	Second.	and,
1611**	1000	+	+	+	+	+	-	161100	-
1452		+	+	+		-	-	women.	-
1608	-	+	+	+	+	-	-	in and	-
		+	+	+		prime.	-	jenne.	-
1620		+	4	4	No.	-			-
1650	2000	7							
	_	+	+	+	-	-	4000	Monte	Mank

*Average dosage level was 7,375,000 units/cow (1475 lb. at 5,000 units/lb. body weight). **Cows with mastitis. *Denotes absence of pencillin residues. *Penotes presence of pencillin residues at the level of > .05 units/ml. of

The authors thank the DeLaval Separator Co. of Chicago, Ill., for the use of the individual quarter milker used in this study.

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The authors thank the DeLaval Separator Co. of Chi-

infusion were found to contain penicillin or other antibacterial substances at a concentration as high as 0.05 unit/ml. of milk. Following intramuscular administration of penicillin in dosages of 5,000 units/lb. of body weight or 6,000,000 units/cow, there were no detectable quantities of penicillin found in milk from the first or subsequent milking.

Penicillin was present in milk from the infused quarters of all cows treated with penicillin in aqueous suspension or penicillin in oil suspension. At postinfusion hour 60, the milk of 1 cow given penicillin in aqueous suspension and milk from all cows administered penicillin in oil contained penicillin. By postinfusion hour 72, milk from all cows treated with penicillin in aqueous suspension was negative for the presence of penicillin, and milk from all but 1 of the cows treated with penicillin oil was positive. In general, this observation substantiates most experimental data regarding penicillin vehicles. ^{3,4,7,8}

Milk from the untreated quarters was also examined for the presence of penicillin, and it was detected in the milk from 12 of 48 untreated quarters (notably the right front quarter). The appearance of a positive reaction in milk from untreated quarters was of a temporary nature. In no case did it remain positive after 24 hours, and the "halos" or zones of inhibition observed in analyzing the results of the disc assay test were extremely small or indefinite. Normal dilution of milk from these untreated quarters with antibiotic-free milk would not affect bacterial fermentations in dairy-processing plants.

Other investigators5 found similar results using oxytetracycline and chlortetracycline, except that the untreated quarters contained drug residues for periods of 1 and 5 days, respectively, for the 2 compounds. In an Ohio study1 involving 11 cows, penicillin was found in 22 of 23 untreated quarters following the administration of 100,000 or 200,000 units of penicillin (aqueous and oil bases). The untreated quarters in all cows were free of penicillin by 48 hours postinfusion. Recently, the transfer of penicillin from treated to untreated quarters was reported in 14 of 17 cows when a more sensitive test was used.3 One worker,6 using a penicillin-dye complex, was unable to detect the presence of penicillin or the dye in milk from untreated quarter(s).

Summary and Conclusions

Milk from 8 cows given 6,000,000 units/ cow or 5,000 units/lb. of body weight (procaine penicillin G in oil suspension) intramuscularly was devoid of penicillin in the first and subsequent milkings (up to 96 hours) when the FDA approved test was used. When the same cows were infused with 100,000 units of procaine penicillin G (oil and aqueous bases) in the right rear quarter, penicillin was detected in the milk from all treated quarters for 36 hours. In all 8 cows, milk from the quarters infused with penicillin-aqueous solution was free from penicillin after 72 hours had elapsed. Penicillin persisted for longer periods when an oil base was used. In 7 of 8 cows at 72 hours, in 5 at 84 hours, and in 4 at 96 hours, milk from quarters infused with penicillin in an oil base contained penicillin residues.

Penicillin was detected in the milk from 12 of 48 untreated quarters (notably the right front quarter). However, the amounts present and its persistence were negligible. Its appearance in untreated quarters was of a temporary nature for none persisted longer than 24 hours, and the zones of inhibition on the sensitivity test plates were small or questionable.

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Genital Effects of

Implanted and Oral

Diethylstilbestrol on Heifers

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IN THIS STUDY, the effects of diethylstilbestrol (DES) implantation were compared with the effects of DES feeding, with special consideration of the genitalia. Such information should aid in making recommendations on the use of this drug in breeding stock. Until now, implantation and feeding of DES have not been advocated for breeding stock, but one might misinterpret the literature as insinuating that the only reason DES should not be given to breeding stock is because of the lack of official approval.¹

Review of the Literature

Although DES has generally been reported as advantageous in beef production, the literature is confusing because in some experiments advantages were shown for feeding DES2; whereas, in others, advantages were shown for implantation.3 Both forms of administration offer benefits; implantation is less expensive and provides each individual with a fixed quantity of the drug, whereas feeding permits therapy to be discontinued at any time, and provides a uniform day-by-day intake of DES. 4.30 Disturbances of the genitalia and reproduction such as vaginal prolapse, mammary stimulation, abortions, and dystocias, attributes to DES at one time,6 are now seldom reported. A 15-mg, implant was found to produce the same response as 10 mg/day orally, when feed efficiency and rate of gain were the only criteria considered.5 Other workers have reported that a 24- or 36-mg, implant is as effective as feeding 10 mg. daily. 10 Implanted DES pellets have been reported to be absorbed at a uniform rate; thus they should produce a uniform response for at least a 150 to 175 days."

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Materials and Methods

Thirty-nine Hereford heifers, about 7 months old, were procured from an Oklahoma rancher. The heifers were open and disease-free, as far as could be ascertained from their history and a physical examination. Eighteen were ovariectomized via laparotomy under local anesthesia. Nine days later, Nov. 1, 1958, the heifers were given a phenothiazine drench, grouped according to weight, and allotted at random to treatment groups (table 1). One treatment group was implanted with 18 mg. of

TABLE 1—Number of Heifers per Group Given DES

Treatment	Spayed	Intaci
None	6	7
18-mg. implant	6	7
10 mg./day fed	6	7

DES subcutaneously in the right ear; 12- and 6-mg. pellets were used since 18-mg. pellets were not available. Another treatment group was group-fed 10 mg. of DES per day per heifer in a grain supplement. The heifers were kept in 3 adjacent feedlots and all cattle in each lot were given the same amount of pes. A basal diet of prairie hay and concentrate was fed at a rate required for daily gains in body weight of about 1 lb. per heifer. Two spayed and 2 unspayed heifers from each lot were slaughtered 10, 15, and 20 weeks after the experiment began, with the exception that 3, rather than 2, unspayed heifers were slaughtered at 20 weeks. Fifteen days after the first phenothiazine drench, another was given. The cattle were slaughtered at an abattoir where the genital organs and pituitary glands were removed for study. Immediately after removal, the pituitary glands were frozen in dry ice and stored below 32 F. Before assay for growth hormone, the temperature was raised to 40 F., at which time the posterior portions of the glands were removed and discarded. The anterior portions were lyophilized and ground in isotonic sodium

TABLE 2-Uterine Weights of Heifers Given DES

Elapsed		Spayed heifers	•		Unspayed heif	ers
time**	Control	Implanted	Fed DES	Control	Implanted	Fed DES
10 weeks	30-34	64-90	77-108	29-47	52-65	83-134
	32	77	93	38	59	108
15 weeks	74-90	59-65	94-106	70-88	58-94	84-106
	82	62	100	79	76	95
20 weeks	18-20	42-54	57-74	77-96	63-92	65-80
	19	48	66	84	78	72

*Range and mean for each slaughter group are given in grams. **After initiation of DES treatment.

chloride solution (physiologic saline solution (PSS)) with a tissue homogenizer. The saline solution suspensions from the cattle within each treatment group were pooled and the supernatant fluid was drawn off for growth hormone assay by the rate tibia test. This fluid was estimated to contain the equivalent of 1 Gm. of anterior hypophyseal tissue per 16 cc.; 0.5 cc. was injected daily into the peritoneal cavity of each treated rat used in the assay. A similar quantity of PSS was injected into control rats.

Results

Weights of the uteri removed from the carcasses immediately after slaughter were determined (table 2). No uteri were actually weighed either at the time the experiment was started or during the 10 weeks thereafter. The uterine weights from 0 to 10 weeks after initiation of DES treatment are hypothetical (fig. 1 and 2) and based

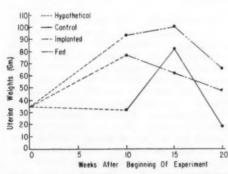


Fig. 1—Average uterine weights of spayed heifers given DES.

on the assumption that: (1) the uterine weights of all the experimental heifers were the same at the beginning of the experiment since they came from the same population, and (2) the uteri in spayed females normally atrophy, whereas those in unspayed females enlarge until the ani-

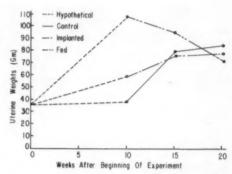


Fig. 2—Average uterine weights of unspayed heifers given DES.

mals have reached maturity. In order to meet these conditions, the initial average uterine weight of the heifers was assumed to have been about 35 Gm. This presumed value fits the subsequent pattern of uterine weight changes obtained for the untreated heifers. Probably the true values represented by the hypothetical lines would not be in a straight line.

Teat lengths were measured after slaughter and removal of the mammae from the carcasses (table 3; fig. 3 and 4). These data

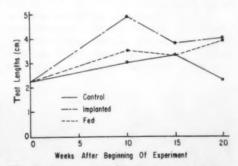


Fig. 3—Average teat length of spayed heifers given DES.

TABLE 3-Teat Lengths of Heifers Given DES

Elapsed		Spayed heifer	S.tt		Unspayed heife	rs
time**	Control	Implanted	Fed DES	Control	Implanted	Fed DES
10 weeks	2.0-4.0 3.0	4.0-5.5	3.5-4.0 3.5	2.5-3.5	3.5-4.0 3.8	2.5-4.5 3.4
15 weeks	3.0-4.0 3.3	3.5-4.0 3.8	2.5-4.0	2.5-3.5 3.0	3.0-3.5 3.4	3.0-4.5 3.9
20 weeks	2.0-3.0 2.3	3.5-5.5 4.0	3.0-5.0 3.9	3.0-5.0	3.0-5.0 4.1	3.0-5.5 4.3

*Range and mean for each slaughter group are given in centimeters. **After initiation of DES treatment.

represent approximate measurements since the injunction of the base of the teat and udder was seldom clearly defined. No secretion was found in any of the teat cisterns at 10 weeks; at 15 weeks some secretion was present in all of the heifers slaughtered; and at 20 weeks some secrenent in the treated heifers than in the untreated, and in the implanted heifers than in the ones fed DES (fig. 7). The foregoing statement is made on the basis of subjective classifications of the heifers since accurate measurements of this characteristic are difficult in live cattle.

Although heifers given DES appeared to have smoother coats and a higher degree of finish, the salvage value was about the same for each group; the untreated heifers graded slightly higher, compensating for their supposedly poorer condition.

Anterior pituitary gland weights and the results of the growth hormone assay were determined (tables 4 and 5). A statistical analysis of the data indicated no significant difference in growth hormone content due to DES treatment of the cattle.

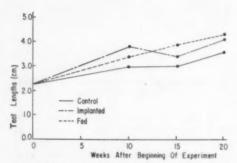


Fig. 4—Average teat length of unspayed heifers given DES.

Discussion

Spayed heifers were used in this experiment because, being more sensitive to estrogenic stimulation, 13 their uterine weights were an indication of the relative amount of estrogenic stimulation. Also, spayed heifers aided in estimating the extent to which response to estrogenic therapy was modified in unspayed heifers by the presence of natural hormones. The relatively large uteri of the untreated spayed heifers at 15 weeks (table 2; fig. 1) is indictative of estrogenic contamination of the basal diet. None of the diet fed between the 10- and 15-week interval was

tion was present in all except the spayed heifers receiving no DES. The secretion found at 15 weeks was of viscous brownish type, whereas that at 20 weeks more closely resembled milk.

Edema of the perineal region became evident in all DES-treated heifers at the end of about 6 weeks and persisted throughout the experiment (fig. 5 and 6). Elevation of the tailhead was more promi-



Fig. 5—Edema of labla vulvae in spayed heifers 18 weeks after beginning of experiment; 18 mg. DES implant (left), no DES (center), and 10 mg. DES fed dally (right).

TABLE 4-Anterior Pitultary Glands of Heifers Given DES

		Spayed heifers*		Unspayed heifers		
Approx.	Control	Implanted	Fed DES	Control	Implanted	Fed DES
Elapsed time**						
10 weeks	161	163	160	160	130	203
15 weeks	214	205	208	208	206	193
20 weeks	216	210	230	203	237	238
Moisture (%) (mg.)	74.5	78.0	77.2	79.0	76.9	74.4
Dry gland (mg.)/cwt. body weight	42.6	43.2	43.2	41.0	39.8	43.6

**Mean weight of dried anterior pituitary glands (mg.). **After initiation of DES treatment. †Average of dried pituitary gland weights divided by the average body weight (in cwt.) of the treatment group.

available for estrogenic assay. In mouse uterine assays of the basal diet fed after this period, no estrogenic activity was shown. Possibly the basal diet fed from 10 to 15 weeks was contaminated in the commercial feed mill where a DES-containing supplement was mixed prior to preparing the experimental diets. Similar difficulty in obtaining DES-free feed has been previously reported.9 As can be expected, the untreated spayed heifers were extremely sensitive to such contamination. The final uterine weight data probably are not greatly affected by DES contamination judging by its small effect on the DES-treated groups.

Eventually, the lines representing uterine weights (fig. 1) might have more nearly coincided if the experiment had been continued for a longer time. Suppositions may be made that the uteri in the control and implanted heifers would continue to atrophy until eventually only rediments remained, due to an absence of the necessary hormones for uterine maintenance. One may theorize, but not definitely state, that the uterus in a DES-fed heifer would finally atrophy to the same extent, since the amount of response appears to vary indirectly with the duration of hormone treatment. From the trends shown (fig. 1 and 2), the DES-fed heifers were greatly stimulated for about 4 months after the initiation of treatment. The decline in uterine stimulation that followed can be attributed directly to a lack of gonadotrophin and deficient ovarian function, and indirectly to the inhibition of the hypophysis caused by the persistently high estrogen levels in the body. This theory is supported by the rather small inactive ovaries observed in the treated heifers. These ovaries had no large follicles such as were present on the normal gonads of the untreated intact heifers. The number of follicles was about the same for all groups of unspayed heifers.

The rate of absorption of implanted DES was not similar in the spayed and unspayed heifers if uterine weight is a result of absorption (fig. 1 and 2). Such differences may have been due to variations in the amount of crushing of the pellets during implantation, to the vascularity of tissues surrounding the implanted pellets, or both. After the process of absorption is complete, an implanted heifer and an untreated heifer eventually should have uteri approximately equal in size. Although the data in this experiment seem to support this supposition, an experiment of longer duration would be more conclusive.

The quantitative effects of DES treatment on teat length are difficult to determine due to (1) the large variation of normal heifers in this respect and (2) the possible errors involved in obtaining teat measurements. Nutritionists have reported that DES affects teat development without definitely stating the amount and permanence of the change.^{2,5} Data from the spayed

Fig. 6—Edema of labia vulvae in unspayed heifers; the labia of all are larger than those in spayed heifers.





Fig. 7—Region of the tailhead in unspayed heifers after 18 weeks. Implanted heifer (left) was the most prominent; control heifer (center), the least prominent, and DES-fed heifer (right), intermediate. Control heifer (center) has rougher coat.

heifers (table 3; fig. 3) are not conclusive, due to the large variation in lengths within treatment groups. Teat lengths, in order to follow the uterine weight trends, should not have increased between 15 and 20

TABLE 5—Growth Hormone Assay of Heifers Given DE5

Treatment (8 rats/group)	Width of epiphseal cartilage of rat tibia (μ)*
PSS **(control)	140± 4.9
Bovine ant. pit. gl.:	
Spayed control	192 ± 8.5
Spayed implanted	186 ± 14.4
Spayed fed	175
Unspayed control	180±14.2
Unspayed implanted	198 ± 13.7
Unspayed fed	187±11.6

*Mean \pm standard error. **Isotonic NaCl solution (physiologic saline).

weeks, particularly in the spayed and unspayed-implanted heifers. Variation in lengths in the untreated heifers tends to follow the pattern of variations for uterine weights. Teat lengths of the intact heifers were increased about 0.6 cm. per teat by DES (fig. 4). No explanation can be given as to why the trend in teat growth in treated spayed heifers did not follow that of uterine growth more closely during the latter part of this experiment.

Of all the characteristics of DES-treated heifers, edema of the perineal region and elevation of the tailhead are most evident to the buyer of live cattle. These characteristics are subjective, rather than specific diagnostic signs, since other factors such as genetic make-up or estrus may cause such characteristics also. Because of the difficulty in differentiating hormone-treated cattle from those not treated, and because the effect of treatment on carcass

grade is controversial, 4.5,10 there is, at present, little discrimination against beef cattle that have been given DES. However, if a buyer suspected from the conformation and available history that the cattle had been treated, he would probably pay less.6

The physiologic activity of DES in animal nutrition has been related to an increase in both weight and growth hormone content of the anterior hypophysis.12 The glandular weights of the experimental heifers tended to vary with the body weight since the heaviest glands were found in the heifers slaughtered last (table 4). These were about 150 lb. heavier than the heifers slaughtered at 10 weeks. The growth hormone content of the anterior hypophysis was not increased by DES treatment of the cattle (table 5). These results are in contrast to results of other work in which DES increased both the weight and growth hormone content of the pituitary glands in immature ruminant animals.11,12 Since the heifers in this experiment were kept under husbandry conditions that limited their weight gains to about 1 lb. per day, the same factors that limited gains might be suggested as a reason for failure of the pituitary glands to contain more growth hormone. Pituitary gland size and growth hormone activity can be compared only after adjustment to an equal body weight basis.12 Since all experimental heifers were about the same weight at any one time in the experiment, pituitary gland size and growth hormone activity could then also be expected to be about the same in all heifers at any given time.

Summary

Both spayed and unspayed heifers were employed to study the genital effects of

diethylstilbestrol (DES) implantation and feeding. Feeding DES in this experiment resulted in a significant response that gradually decreased after about 4 months in both spayed and unspayed heifers. The chief criterion of response was the increase in uterine weight, Implants of 18 mg. of DES did not appear to influence the genital organs as much as 10 mg. of DES per day in the feed, but the effects from the former treatment were equally persistent. Teat lengths were increased by both feeding and implanting DES. Teat length was not an accurate measurement of the quantity of DES given to the experimental cattle although all treated cattle had greater teat development. Perineal edema and high tailheads were present in nearly all the treated cattle from about 6 weeks after treatment until slaughter.

The results of this investigation were confounded by apparent contamination of some of the basal diet with DES. Neither the quantity nor the extent of contamination was known. Apparently the extraneous DES was not present in sufficient quantities to greatly affect any but the untreated spayed heifers. After the contamination was discovered none of the suspected feed was available for estrogenic assay.

Anterior pituitary gland weights and growth hormone content were not increased by either form of DES administration. This observation may have been the result of keeping the average body weights of all cattle approximately equal by limiting feed intake.

The use of DES, either implanted or fed, cannot be recommended for breeding stock until the permanence of the effects are more thoroughly studied. In animal nutrition, DES seems to exert its greatest influence on the genitalia during the first few months, after which the effects diminish.

An experiment of longer duration is necessary to ascertain whether the genitalia of young heifers will return to normal after DES treatment for an extended period.

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Udder Pox Treated Successfully

In 11 herds of cattle in Switzerland, 75 cows were inoculated intracutaneously with lyophilized pox extract to combat pox lesions on the udders. Of 63 infected cattle, 56 recovered completely within 14 days and none relapsed. In 7 cattle, there was slow recovery. No complications occurred.—Schweiz. Archiv Tierheilk., 10. (Oct., 1960): 565.

African Swine Fever

in Wart Hogs in Kenya-A Preliminary Report

D. E. DeTRAY, D.V.M.
D. ZAPHIRO
D. HAY, F.I.M.L.T.

IT HAS BEEN established that wart hogs (Phacochoerus sp.) and bush pigs (Potomochoerus sp.) may act as inapparent carriers of African swine fever (ASF) virus.² Little information is available, however, concerning the incidence and geographical distribution of such carriers. A survey of the incidence of this infection in wild swine indigenous to Kenya was planned as part of an epizootiologic survey.

Review of Literature

Recovery of ASF virus from wart hogs in their natural habitats was first reported in South Africa. Blood samples from 3 of 4 apparently healthy wart hogs from one area produced ASF when injected into domestic pigs, whereas blood samples from 6 wart hogs from another area failed to produce ASF. Later, ASF virus was recovered in 2 of 4 other wart hogs. Still later, a map of the approximate distribution of wild pigs in South Africa was prepared. In this report, ASF virus was shown as having been recovered from 6 of 11 wart hogs and 2 of 7 bush pigs. In Kenya, ASF was first recovered from 1 of 3 wart hogs tested in 1954.

The purpose of this report is to record the results of a safari that was made to obtain additional information on the incidence of ASF infection in wart

hogs. The area selected was about 75 miles south west of Nairobi. Wart hogs were known to be numerous in this area where domestic pigs have never been introduced.

Experimental Procedures

Nine wart hogs were shot, and samples of blood, lymph nodes, and spleen were obtained from each. Serums were also obtained for future investigations. Five of the wart hogs were infested with ticks; 5 to 10 ticks were collected from each infested wart hog.

Blood and tissues samples were placed in 25-ml. bottles containing 5 ml. of a preservative consisting of 3 per cent sodium citrate in distilled water, penicillin (1,000 units/ml.), streptomycin (1 mg./ml.), and mycostatin (1,000 units/ml.). The specimens were held in a gas-operated refrigerator (10 C.) at the camp until removed to the laboratory. The ticks were held without preservative or refrigeration. At the laboratory, equal proportions of the samples of blood, lymph nodes, and spleen from each wart hog were combined and macerated. After light centrifugation, 5 ml. of each of the 9 supernatant fluids was inoculated into a domestic pig.

The ticks from each of 3 wart hogs were macerated in 2 ml. of 0.85 per cent sodium chloride solution and a domestic pig was inoculated with each tick suspension. The 12 domestic pigs used in this experiment were housed individually in isolation stalls.

Results

African swine fever virus was recovered from 5 of the 9 wart hogs. The results are given (table 1).

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The writers are indebted to Miss Jane Walker, B.Sc., of the East African Veterinary Research Organization, for identifying the ticks collected in this survey.

The clinical signs and lesions seen at necropsy in the 5 domestic pigs that sickened and died were typical of ASF infections. The 4 domestic pigs that remained normal were proved to be susceptible to ASF by subsequent challenge of immunity. Extracts of macerated ticks from 2 infected wart hogs and from 1 noninfected wart hog failed to infect domestic pigs. These 3 domestic pigs were also susceptible to ASE to subsequent challenge of immunity.

Discussion

The seriousness of ASF as a devastating disease of domestic swine has been discussed previously.3,5 Knowledge of the incidence of ASF carriers among wild swine of Africa is important to plan suitable control measures. So long as these carriers exist there will be a constant reservoir of ASF virus and a potential source of infection to the swine industry. In view of the incidence reported, the risk is considerable unless strict control measures, aimed at preventing spread from wild to domestic swine, are observed. Legislation has been enacted in Kenya to assure that control measures are carried out. This legislation requires that domestic pigs be enclosed at all times and the movement of pigs be under veterinary control. A slaughter policy has been adopted for the rapid suppression of epizootics in domestic pigs, and compensation is paid to the owners of slaughtered herds. In addition, a bounty of 5 shillings is paid for each wart hog or bush pig destroyed. These measures have proved highly successful for controlling ASF in Kenya.4

The mechanism of transmission between wart hogs and from wart hogs to domestic

pigs is not completely understood;² therefore, the possible role of ticks was investigated. *Rhipicephalus simus simus* ticks were collected from 2 of the infected wart

Veterinarians must be continuingly alert in order to forestall establishment of so-called foreign diseases, which under modern conditions of transportation may be introduced at any time. It is because of the need for prompt, accurate diagnosis, that American workers are conducting cooperative studies in Muguag, Kenya, East Africa to develop methods of differentiating African swine fever from hog c h o l e r a.—M. S. Shahan, director, Plum Island Animal Disease Laboratory.

hogs. These ticks were dead on arrival at the laboratory. Thus the failure to obtain virus from them is not conclusive evidence that ticks are not involved in the transmission of ASF. In addition to *R. simus simus*, other species were collected for identification from some of the noninfected wart hogs. The 3 additional tick species from the noninfected hogs were identified as *Amblyomma gemma*, *Hyalomma albiparmatum*, and *Hyalomma impeltatum*. It is planned to investigate further the possible role of ticks in the transmission of ASF, but thus far there is no indication that they play a part.

The 9 wart hogs were shot in an area never inhabited by domestic pigs. This further strengthens the belief² that ASF is

TABLE 1—African Swine Fever in Wart Hogs—Tests in Domestic Pigs

		Wart hogs	Domestic p	igs (inoculated	March 26, 1959)	
Hog No.	Day killed (March, 1959)	Description	Age (estimated)	Sickened (days postinoculation)	Survived (days post- inoculation)	Remarks
1	14	Mature male	3 years	5	9	****
2	15	Old male	5 years		911	Remained normal.
3	16	Young male	1 year	5	11	****
4	17	Mature male	3 years	****	****	Remained normal.
5	19	Mature male	2 years	****	***	Remained normal
6	20	Old male	6 years	4	11	****
7	22	Mature female	3 years	1 mine		Remained normal.
8	23	Young male	7 months	. 2	10	****
9	23	Young female	7 months	4	12	***

primarily an inapparent infection of wild swine and that it is unnoticed in nature unless domestic swine are introduced into the environment; however, once established in domestic pigs, the disease spreads rapidly by contact and produces a mortality

approaching 100 per cent.

The 9 wart hogs were shot within a radius of 5 miles. Since it appeared that all 9 had equal opportunities for exposure, it was difficult to explain why ASF virus was recovered from some and not others. Age and sex did not appear to be factors. The fact that virus was not recovered from 4 hogs did not prove that they were not infected. The virus may have been present in tissues other than those selected for testing. Moreover, some or all of the 4 may have been infected previously. The maximum duration of infection in wart hogs is unknown, but there is some evidence that they do not remain carriers for life.²

Two of the wart hogs from which the virus was recovered were undoubtedly littermates, since they were found with a sow wart hog, which was not shot. It would be interesting to know if certain wart hog families are all carriers. Intrauterine transmission may be a possible explanation for the maintenance of ASF infection in wart

hogs.

The 5 wart hogs from which virus was recovered appeared normal in every respect.

Evidence that wart hogs have ill effects from ASF infection is not available.

Summary

African swine fever (ASF) virus was isolated from 5 of 9 wart hogs shot in one area of Kenya over a period of 10 days. Wart hogs may serve as inapparent carriers of ASF and constitute a potential threat to the swine industry.

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Protection from African Swine Fever Lacking

As yet, there are no reliable biological products for active immunization against African swine fever, nor have any effective antiserums been produced for possible immunization. Development of these products is complicated by the fact that pigs which recover from an attack of the disease may again become infected following exposure. Although this virus appears closely related to hog cholera virus, hog cholera vaccines afford no protection against African swine fever. Pigs of all breeds are susceptible.—Information Note No. 165, Internat. Off. Anim. Dis., Paris, France, Oct. 31, 1960.

Interrelationship of Growth Rate, Hemoglobin Dilution,

Packed Cell Volume, and Incidence of

Anemia in Suckling Pigs

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Suckling pigs raised on concrete or wood floors need a supplemental source of iron in order to prevent anemia.3,5,8 Early observations indicated that slow-growing pigs raised in an anemia-producing environment did not have the characteristic signs of anemia.7 This fact suggested that anemia might be due, in part, to rapid growth and an associated hemoglobin dilution which baby pigs experience within a few weeks after birth. Rapid-growth and hemoglobin dilution as a cause of baby pig anemia is also suggested by the lack of diagnosed anemias in other large farm animals whose physiologic growth is not as rapid as that of the pig.2

The purpose of this study was to evaluate the interrelationships of growth rate, hemoglobin dilution, packed cell volume (PCV), and the incidence of anemia in sucking pigs, since little or no research has been reported on these interrelationships.

Materials and Methods

Eighteen crossbred, "specific-pathogen-free' (SPF) piges" from 2 litters were allotted at random within litters to 2 treatment groups. These treatment groups consisted of: (1) control group, no supplemental iron until 25.0 days of age, and (2) treated group, supplemental iron at 4.5 and 22.5 days of age. The

iron treatment consisted of an intramuscular injection of 2 ml. of an iron-dextran compound* (50 mg. Fe/ml.).

The litters were confined to concrete pens without creep feed, but had access to their dam's feeder and water. Wood shavings were used for bedding. Pig weights, body specific gravity, and blood samples were obtained at varying intervals throughout the 7 weeks of the experiment, semiweekly for the first 2 weeks, weekly for the next 3 weeks, and 2 weeks later for the final determination. A 2.5-ml. blood sample was obtained by cardiac puncture from every pig at each testing. Heparin sodium was used as an anticoagulant. The blood samples were analyzed for whole blood specific gravity, hemoglobin, and packed cell volume.

Whole blood specific gravity determinations were made using the copper sulfate technique. Hemoglobin determinations were made with the direct photometric method, using dilute ammonium hydroxide. The pcv determinations were made using a standard technique, Modified to the extent that samples were centrifuged at 1,600 r.p.m. for 45 minutes.

Body volume values needed for finding the body specific gravity were obtained by determining the volume of water displaced by the immersed pig. A container, in which a 30-lb. pig could be immersed, was filled to the rim with warm water. Each pig was anesthetized and its body immersed in the water up to the head. The amount of water required to refill the container was considered as the quantity of water displaced by the pig's body. To determine head volumes, several pigs of different weights were completely immersed in water after a body immersion determination had been made. From these determinations, factors were obtained for head volumes and

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^{*}Armidexan, Armour Veterinary Laboratories, Kankakee,

plotted against weight. The formula used to determine head volume factors was:

body + head displacement in water, head volume factor = body displacement in water

A relatively constant value was obtained after the pig reached 13 lb. of body weight. The head volume factor was multiplied by body displacement in water values to obtain the body volume value needed for the specific gravity determinations.

A statistical appraisal of the data was made. 41 All statements concerning statistical significance are made at probability (P) = 0.05 or less.

Results

The results of this experiment are tabulated (table 1). The growth rate of pigs in both groups was similar up to 15 days of age. At 22 days of age, the pigs treated with iron each weighed an average of 2.78 lb. more than pigs in the untreated control group. This difference was statistically significant. At 29 and 43 days of age, the differences in weights between pigs in the 2 groups had increased to an average of 4.96 and 6.33 lb. each, respectively. The difference in weight at 29 days of age was statistically significant, but the 43-day weight difference was not.

Body specific gravity values were similar throughout the experimental period. The values reached a peak at 8 days of age and thereafter declined irregularly. The levels reached at the end of the experiment were higher than those obtained at 1 day of age.

Blood specific gravity declined beginning at 1 day of age. This decline reached a low level at 11 days of age in the control group and remained at this level until supplemental iron was administered. Within 1

week after treatment, supplemental iron caused the specific gravity of the blood of the treated group to return to one comparable to that obtained at 1 day of age. The specific gravity then remained fairly constant, with only slight variations. The second iron treatment of pigs in this group resulted in raising the specific gravity value to its highest level on the last day of the experiment.

The differences in average blood specific gravity values between the control and the treated pigs were significant at days 8, 11, 15, 22, and 29. Treatment of the control group with iron on the day 25 resulted in blood specific gravity values similar to those obtained for the treated pigs by the end of the experiment.

Hemoglobin levels of the control group were lower at 1 day of age than those of the treated group. This was probably due to random allotment since treatments were randomly assigned within litters. Apparently, this did not affect the results since pigs in both groups experienced a similar decline in hemoglobin until the treated pigs were given iron. The hemoglobin levels in pigs in the control group continued to decline to 3.23 Gm./100 ml. of blood at 22 days of age. Treatment of the control pigs with iron on the day 25 resulted in a twofold increase in hemoglobin level within 4

After the initial iron treatment, the hemoglobin of the pigs in the treated group returned to a level comparable to that obtained at 1 day of age and it remained near this level with a slight decline by day 22. The second iron treatment brought the hemoglobin level to its highest point on day 43 when the experiment was terminated. The differences in hemoglobin levels be-

TABLE 1-Effect of Iron Treatment on Growth Rate, Body Specific Gravity, and Certain Blood Components of Suckling Pigs*

Age		eight (b.)	Body	sp. gr.	Blood	sp. gr.		oglobin, 100 ml.)	PCV	(%)
(days)	Control	Treated	Control	Treated	Control	Treated	Control	Treated	Control	Treated
1	3.16	3.18	0.802	0.774	1.043	1.043	9.41	10.22	40.28	38.44
4	4.62	4.29	1.003	1.000	1.038	1.038	7.76	8.15	29.03	. 30.16
8	6.39	6.17	1.044	1.072	1.035	1.041+	6.17	9.60+	22.99	37.37
11	7.68	7.73	1.023	1.054	1.033	1.044+	4.80	9.544	21.82	40.20
15	9.26	9.93	0.993	0.980	1.033	1.042+	4.24	9.55+	18.40	36.95+
22	10.84	13.62**	1.002	0.990	1.033	1.043+	3.23	8.85*	13.71	33.60+
29	12.10	17.06**	0.964	0.962	1.037	1.044+	6.55	9.349	30.61	39.02
43	19.37	25.70	0.927	0.865	1.044	1.046	9.58	10.63	38,46	39.30

Data based on 9 pigs in each treatment group, except on days 29 and 43; on these days, control group data were based on 7 pigs, treated group data, on 8 pigs. Treatment of pigs in control group was on day 25, on pigs in treated group, at 4.5 and 22.5 days of age.

**P = 0.05; †P = 0.01.

tween the control and the treated pigs were statistically significant on days 8, 11, 15, 22, and 29.

Packed cell volume values followed a pattern similar to that of hemoglobin. The average PCV for the control group declined markedly until the pigs were treated with iron on day 25. The treatment resulted in a dramatic increase in the PCV within 4 days (from 13.71 to 30.61). The PCV of pigs in the treated group declined in a manner similar to that of pigs in the control groups until treated with iron at 4.5 days. From this point, the PCV increased until day 11 and then declined gradually until the pigs were given the second iron treatment at 22.5 days of age. Differences in PCV values between pigs in groups were significant on days 8, 11, 15, 22, and 29.

Correlations among criteria of response within treatment are given (table 2). Higher correlations were obtained among the data of the control group. The correlation between body weight and body specific gravity in pigs in the control group was simple correlation coefficient (r) = 0.58 and in pigs in the treated group r = 0.38. Body weight and hematologic data of pigs in the control group had a slight negative correlation, whereas that of pigs in the treated group had little relationship, although hemoglobin and PCV had a slight negative correlation.

Body specific gravity was negatively correlated with all hematologic data. The correlations of pigs in the control group had a higher negative correlation than those of pigs in the treated group. This relationship was also found for body weight.

Correlations among hematologic data indicate a high positive correlation in pigs in the control group, but considerably lower correlations in pigs in the treated group.

Discussion

In the original experimental plan, it was intended that the pigs in an untreated control group not be given supplemental iron. However, when visual observations of anemia such as paleness of the mucous membranes, labored breathing, retarded movements, and dehydration were supported by hematologic evidence which indicated no lessening of the severity, it was decided that supplemental iron was needed

to prevent death or serious growth retardation. A 2-ml. injection of iron-dextran was given on the day 25 to this group. Subsequent blood analyses indicated that

TABLE 2—Correlations Among Criteria Used to Evaluate Response of Suckling Pigs to Iron Therapy

		-		
Control	BSG	BISG	Hb	PCV
BW	.58	84	99	96
BSG	****	80	68	79
BISG	****	****	.90	.91
Hb	****	****	****	.98
Treated				
group	BSG	BISG	Hb	PCV
BW	.38	.04	20	07
BSG	****	02	45	07
BISG	****	****	.73	.84
НЬ	****	****	****	.89

BW = body weight; BSG = body specific gravity; BISG = blood specific gravity; Hb = hemoglobin; and PCV = packed cell volume.

a rapid and complete recovery was occurring.

The increase in growth due to a supplemental iron treatment agrees with the findings of others. 10,12,13,16 This does not agree with an earlier report from this station,1 which indicated the SPF pigs derived no benefit from an iron injection. However, the difference between results may be due to experimental procedure, since creep feed was provided at 7 days of age to the pigs in the earlier experiment. This feed may have provided sufficient iron to maintain adequate body levels for satisfactory growth. Whereas the pigs in the experiment reported herein were not given creep feed per se, it was observed that pigs from both treatment groups began eating from their dams' feeders about day 35. The additional iron intake by the pigs may have influenced the character of the blood. However, this source of iron was considered negligible since pigs in both groups had been given supplemental iron and the hematologic data indicated that recovery of the control group was occurring before they started eating solid feed.

The correlations between whole blood specific gravity and hemoglobin level and PCV values were quite high within experimental groups. This may indicate that there is a close relationship between blood fractions during a deficiency or stress condition.

Due to the high correlation of whole

blood specific gravity and body weight in pigs in the anemic control group, it was felt that whole blood specific gravity could be used for field diagnosis of anemia in which exact hematologic values are not necessary. The equipment needed for this determination is quite simple and is less expensive than that needed for hemoglobin or hematocrit determinations. In fact, only 1 copper sulfate specific gravity standard solution would be needed. Based on data reported herein, the standard specific gravity solution should be 1.035* If a drop of whole blood is stationary or rises in this standard, the pig may be considered anemic. This technique affords a quick and simple diagnosis of pig anemia.

The high negative correlation between body weight and hemoglobin of pigs from the control group indicates that hemoglobin dilution may be occurring. This type of negative correlation is expected in an anemic condition. The slight negative correlation between body weight and hemoglobin of the treated group supports the dilution theory, but is not considered large enough for a definite confirmation. The blood volume dilution theory has been offered as a possible cause of anemia.⁶

Summary

Eighteen "specific pathogen-free" (SPF) pigs from 2 litters were used to evaluate the interrelationships between growth rate, body specific gravity, certain blood components, and incidence of anemia in suckling pigs. Pigs treated with an injectable iron-dextran compound grew significantly faster than untreated pigs. Significant differences in hemoglobin levels, PCV, and whole blood specific gravity were observed between pigs in the treated and untreated groups at 8, 11, 15, 22, and 29 days of age. Injectable iron was effective in promoting rapid recovery from a severe iron-deficiency anemia.

Correlations between body weight and hemoglobin levels suggest that hemoglobin dilution occurs. The high correlation obtained between whole blood specific gravity, hemoglobin levels, and PCV values indicates that whole blood specific gravity can be used for field diagnosis of anemia.

Results indicate that suckling SPF pigs reared on concrete without access to creep feed need supplemental iron for the prevention of iron deficiency anemia.

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^{*}Prepared by adding 65.7 ml. of distilled water to 34.3 ml. of a stock solution of copper sulfate (D=1.100). The stock solution can be prepared by dissolving 170 gm. of reagent grade CuSO₄ * 5H₂O in 1,006.0 ml. of distilled water at room temperature (75 F.).

Autogenous Fowl Cholera Bacterin

for Turkeys

Bert W. BIERER, V.M.D.
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SINCE DEVELOPMENT OF Pasteur's successful attenuated fowl cholera vaccine, numerous fowl cholera vaccines have been prepared. Effectiveness of these vaccines has been variable. Commercially produced fowl cholera bacterins and combined fowl cholera-typhoid bacterins have been produced for several decades. The value of these bacterins was seriously questioned during the early 1920's. 1.2.6.7

More recently (1958), it was demonstrated that a commercially produced fowl cholera bacterin was of questionable value in stimulating an immune response, while 4 of 5 experimental bacterins produced an effective immunity against fowl cholera. It was further demonstrated that an emulsified formalin-killed immunizing agent was capable of establishing a high degree of immunity in chickens for at least 1 year. This latter type of fowl cholera bacterin has since been produced on a commercial basis.

The emulsified formalin-killed fowl cholera bacterins have little value in flocks infected with acute fowl cholera because the immune response they stimulate is slow to develop.

Preparation of the Bacterin

In the diagnostic laboratory, Pasteurella multocida cultures are routinely made, and to assure purity, a tryptose agar slant subculture is made from the 24-hour-old initial culture. The pure subculture is used for biochemical tests to identify the culture. When fowl cholera was suspected, 1 cc. of saline washing of the tryptose agar

slant subculture was used to inoculate as many 2,000 flasks (1-cc.) of tryptose broth as were needed to produce bacterin to vaccinate the infected flock. Each flask provided 1,000 doses of bacterin. After 24 hours of incubation, 22 cc. of liquid phenol was added to each flask which, when agi-

TABLE 1—Pasturella multocida:* Titration of End
Point Mortality

Group	No. of birds	Dilution of challenge dose of 0.1 cc. i.m.**	Estimated No. of bacilli	Total No. died (%)
1	5	10-2	300,000	100
2	5	10-3	30,000	100
3	5	10-4	3,000	100
4	10	10-5	300	100
5	10	10-6	30	70
6	10	10-7	3	20

*A virulent field strain. **Basic concentration of 0.25 optical density on Bausch and Lomb Spectronic 20 Colorimeter or No. 1 on McFarland scale.

tated, killed the growth. Extreme care in this latter step is considered imperative. While sterility tests required additional time, the bacterin itself was produced within 3 days after the infected birds were presented for examination. Simultaneously with this procedure, routine identification of the culture was established.

After preparation of the bacterin, the vaccine may be bottled and labeled for identification. The practicing veterinarian may find it convenient to bottle the vaccine in used sterilized 500-cc. anti-hog-cholera serum bottles.*

From the South Carolina Agricultural Experiment Station, Columbia. Technical contribution No. 339. Published with permission of the director.

^{**500} cc. amber bottles may be purchased from Owens-Illinois Co., Charlotte, N.C.; mold No. A-9514 and stoppers, from the West Company, Millville, N.J., No. 13 sleeve stopper, No. 123 red.

TABLE 2—Survival of Vaccinated and Nonvaccinated Turkeys Challenged with Pasteurella multocida (Fowl Cholera) Organisms

Pen	No. turkeys vaccinated	No. turkeys not vaccinated	Per cent vaccinated survived	Per cent Non-vaccinated survived	No. days after vaccinated
1	4	3	25	0	2
2	4	3	50	0	4
3	4	3	25	0	6
4	4	3	25	0	8
5	4	3	75	0	10
6	4	3	50	- 0	12
7	4	3	25	0	14
8	4	3	50	0	16
9	4	3	50	33	18
10	4	3	50	0	20

Immunity Response

Immunity was challenged in turkeys in 10 pens, each containing 4 vaccinated (2 cc. intramuscularly) and 3 nonvaccinated 8week-old turkeys. Immunity in turkeys in the first pen was challenged with Past. multocida 2 days after vaccination, in the second pen, 4 days, and so on; immunity in turkeys in the tenth pen was challenged 20 days after vaccination. The minimum challenge dose consisted of a saline suspension and contained an estimated 30 Past, multocida bacilli. It was prepared from a 24-hour-old tryptose agar slant. Saline washing of the culture was used to prepare the bacterin. The minimum challenge was given to 1 vaccinated and 1 nonvaccinated bird. The concentration of Past. multocida in the challenge dose was increased tenfold for each succeeding 2 birds. The maximum challenge dose contained an estimated 30,000 bacilli. Since it has been previously determined that an estimated 30 bacilli would result in a 70 per cent mortality in 8- to 10-week old turkeys, any dose greater than this was considered a severe challenge (table 1). Results are given (table 2).

Summary and Conclusions

1) A simple broth bacterin, easily prepared and ready for use 3 to 4 days after obtaining cultures from infected turkeys, provided immunity in 1 of 4 experiment turkeys, 8 weeks old, as soon as 2 days after innoculation with 2 cc. of the vaccine given intramuscularly.

2) The degree of immunity increased to as much as 50 per cent by the tenth day and remained about 50 per cent effective until the 20th day, after which time no further observations were made.

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Eperythroxoonosis in Cats

In a survey of Eperythrozoon felis infection in 126 cats in the London area, to determine whether this organism could be associated with the presence of ectoparasites, E. felis was not found in any blood specimens.—Vet. Rec., 72, (1960): 397; abstr. from Vet. Bull., 30, (Sept., 1960): item 2846.

Canine Mammary Adenocarcinoma

with Metastasis to Bone—A Case Report

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MAMMARY ADENOCARCINOMA is the most common neoplasm of the dog. It tends to metastasize early, and the most common sites are the regional lymph nodes and lungs. Other sites of metastasis are not uncommon, and widespread dissemination may occur.³ However, to our knowledge, metastasis to bone has not been previously reported in the dog, although it is relatively common in man.⁴ A case of disseminated mammary adenocarcinoma with bone metastasis is the subject of this report.

A female German Shepherd Dog, 9 years old, had paresis of the hindquarters, which was most pronounced on the left side. This resulted in an awkward gait, resembling that seen in hip displasia. There was a marked atrophy of the extensor muscles of the left thigh, and the tail was partially paralyzed. No crepitation was present in either of the acetabular joints.

Abdominal palpation revealed a firm, abnormally sensitive mass approximately 6 cm. in diameter ventral to the lumbar vertebrae and just craniad to the sacrum. This mass could not be palpated per rectum, but a chain of firm, insensitive swellings was palpable per rectum along the ventral aspect of the sacral and coccygeal vertebras. A similar mass was palpable caudal to the left acetabulum.

The right fourth mammary gland contained 2 firm masses which were well circumscribed and discrete. Firm masses, which were well circumscribed and discrete. Firm masses, which on palpation appeared to cross the midline, occupied

most of the right and left fifth mammary gland. The only other palpable mass was a firm, spherical, enlargement of the right axillary lymph node, 2 cm. in diameter.

On radiographic examination, there was a large area of increased density ventral to the sixth lumbar vertebra, with downward displacement of the descending colon (fig. 1). There was rarefaction of the sixth lumbar vertebra and some apparent osteogenic activity. Lung fields appeared normal (fig. 2). On the basis of the clinical and radiologic findings, a poor prognosis was made and euthanasia was performed.

On necropsy, neoplasms were found in the left fourth and left and right fifth mammary glands. The neoplasms were well circumscribed, firm and yellowish white on cut section. The left axillary lymph node was obliterated by similar neoplastic tissue. A diffuse fibrinopurulent peritonitis was present, and the omentum was adhered to the left internal iliac lymph node which measured 3 by 4 by 6 cm. The right internal iliac node measured 4 by 5 by 8 cm. and was, in part, abscessed. A beta hemolytic Streptococcus was cultured from the abscess. Smaller neoplastic masses of similar structure were seen grossly in the anterior mediastinal, bronchial, and sacral lymph nodes, the spleen, and the adrenal glands. The body of the sixth lumbar vertebra contained a neoplastic mass which had invaded the vertebral canal (fig. 3). The adjacent internal iliac lymph nodes were loosely attached to the lumbar vertebras and were completely separated from the tumor mass in the vertebral body by a layer of intact bone. The ventral surface of this bone had an irregular osseous enlargement. The neoplasm was diagnosed at necropsy as a mammary adenocarcinoma with multiple metastases. Sections of lymph nodes, mammary glands, lungs, heart, spleen, liver, stomach, small intes-

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The authors thank Mr. William R. Hommel, Clinical Photography Laboratory, Fitzsimons General Hospital, for taking the photomicrographs and copying the gross photograph and radiographs.

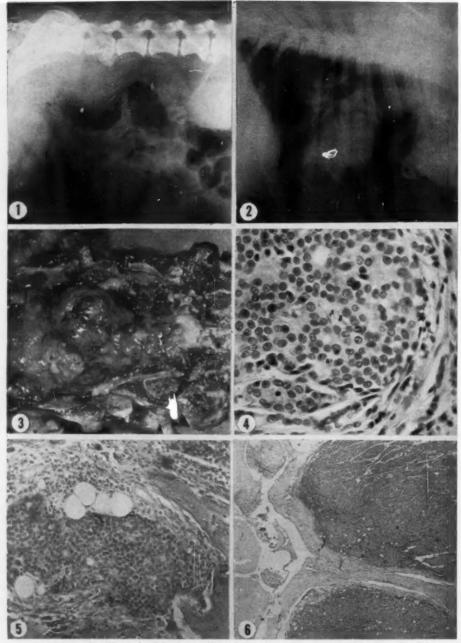


Fig. 1—Lateral radiograph of lumbar region of dog. Ventral aspect of tumor is outlined by gas-filled colon. Osteogenic activity is visible at body of sixth lumbar vertebra.

Fig. 2—Lateral radiograph of thorax of dog. Lung fields appear normal.

Fig. 3—Neoplastic mass is visible on ventral surface of lumbar vertebras.

Fig. 4—Neoplasm in mammary gland. H & E stain; x 425.

Fig. 5—Metastasis in body of vertebra. H & E stain; x 255.

Fig. 6—Metastasis in vertebral canal. Neoplastic tissue surrounds a spinal nerve. H & E stain; x 17.

tine, colon, pancreas, adrenal glands, kidneys, urinary bladder, ovaries, uterus, lumbar vertebras, brain, and spinal cord were collected for histopathologic examination.

Microscopically, the lesion in the affected mammary glands was seen to have almost completely replaced the normal tissue with large nests and sheets of epithelial cells in a dense connective tissue stroma (fig. 4). The tumor did not tend to become encapsulated, and the adjacent connective tissue was diffusely infiltrated by tumor cells. The neoplastic cells had large round-toovoid nuclei, scant cytoplasm, and indistinct cellular boundaries. In certain areas, there was some degree of acinar formation and some acini contained eosinophilic amorphous material. Mytotic figures were common. Metastatic tumors similar in cell type and manner of growth were found in the axillary, mediastinal, internal iliac, and sacral lymph nodes, the spleen, the adrenal glands, the lungs, the auricular appendage of the heart, and the sixth lumbar vertebra. The metastases in the heart, axillary and mediastinal lymph nodes, and the spleen had a greater degree of acinar formation and secretion than metastases in other tissues.

The metastases to the lumbar vertebrae consisted of a diffuse infiltration of neoplastic cells in the form of large nests into the cancellous bone, replacing the myeloid elements (fig. 5). In the vertebral canal, the neoplasm was observed to grow around and between the trunks of the spinal nerves without pentrating the epineruium or the spinal meninges (fig. 6). The histopathologic diagnosis was primary adenocarcinoma of the mammary glands with widespread metastasis.

In this dog, lung metastasis was not diagnosed at necropsy. The lesions were microscopic and minimal, and probably represent delayed spread, contrary to the usual early pulmonary involvement in canine mammary carcinoma. The extensive involvement of the lumbar vertebra would indicate a metastatic lesion of long standing. In the lungs, microscopic findings of numerous metastases, which were not found on radiologic and necropsy examination, would indicate that in the establishment of the prognosis for carcinomas with known propensities to pulmonary metastasis, a negative radiograph is not necessarily of diagnostic significance. The paresis seen was probably caused by mechanical pressure of the expanding neoplasm upon the spinal nerves.

To our knowledge, this is the first reported instance of metastasis of canine mammary carcinoma to bone. There have been unpublished cases of bone metastasis from transitional cell carcinoma and pancreatic adenocarcinoma.2 Possibly, bone metastases of carcinomas are rarely seen in the dog because the dog is euthanatized before such widespread metastases occur. Another possibility is that the bone is not frequently thought of as a site for metastasis, and hence is not examined in cases of carcinoma.

Summary

Canine mammary adenocarcinoma with widespread metastasis, including metastasis to bone, was found in a German Shepherd Dog.

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Rabies in Florida Cats

Of 44 house cats diagnosed rabid in Florida, none was known to have attacked other cats or other domestic or wild animals. One rabies case involved a bobcat.

The source of the infections in cats was not determined.-Sci. News Letter, 78, (Nov. 19, 1960): 329.

Leptospira Infection in Iowa Dogs

J. L. BRAUN, M.S.

CANINE LEPTOSPIROSIS is a disease of defined public health and veterinary clinical importance.³ Leptospira canicola was the serotype originally identified with canine infection. Through subsequent serologic and isolation studies, other Leptospira sero-types were implicated in the epizootiology of canine leptospirosis.¹¹ Indications are that inapparent or subclinical infections in dogs may be more frequent than frank clinical infection.² Consequently, numerous serologic surveys have been conducted in attempts to estimate the prevalence of canine leptospirosis,^{1,6,11,14}

Variation in the prevalence of various serotypes exists. In a study to determine serologic evidence of infection in 279 dogs. it was reported that 27.6 per cent of the dogs were positive for L. canicola antibodies.1 Conversely, in another study, it was shown that 22.0 per cent of 311 dogs were serologically positive for Leptospira icterohaemorrhagiae antibodies.6 The reported prevalence of serologically positive dogs has ranged from 1.3 per cent9 to 39.8 per cent.14 As pointed out by the Committee on Leptospirosis, U.S. Livestock Sanitary Association,5 procedural differences may contribute to apparent variations in survey results. In addition, the occurrence of occasional paradoxical reactions may contribute to erroneous implication of an infecting serotype. In a paradoxical reaction, homologous antibody titer is lower than the titer of 1 or more of the heterologous antibodies.

Other Leptospira serotypes, particularly Leptospira pomona, have become estab-

lished on an epizootic level in cattle and swine. 12 Leptospira pomona infection rates in cattle are reported to vary from 5 to 50 per cent in various sections of the country; likewise, in hogs, the rate may be as high as 25 per cent in some areas of the coun-

TABLE 1—lowa Canine Leptospirosis Survey; Titor
Distribution of 28 Positive Blood Serums

	Serotype						
Titer	L. pomona	L. ictero.	I canicola				
Neg.	13	13	13				
	2	5	6				
10	3	8	5				
20	3	1	1				
20 40	5	1	2				
80	1	0	1				
160	0	0	0				
320	0	0	0				
640	1	0	0				
Weighted							
mean	9.2	2.9	2.5				

try. 10 Dogs may become infected with *L. pomona* under usual farm exposure conditions; 4 however, evidence of prevalence according to various surveys 1,6,11,14 indicates that this rarely occurs.

Extensive epidemiologic studies on human leptospirosis in Iowa have been conducted during the last 3 years. During these investigations, efforts were made to identify *L. pomona* animal reservoirs. The majority of human infections were traced to contact with infected cattle and swine; however, in some instances the status of Leptospira infection in rural dogs was investigated. This survey was designed as an adjunct to the Iowa epidemiologic studies.

Materials and Methods

Prior to this survey, 20 dogs were tested in the investigations of leptospirosis in man during 1958 and 1959. The specimens were collected and tested

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by the same methods as those which will be described for the actual survey specimens.

The survey was conducted from Nov. 2, 1959, to March 22, 1960, during which, 354 canine blood specimens were obtained. The specimens were collected from 354 healthy dogs, 6 months to 5 years

counter many absolute paradoxical reactions. In healthy dogs, the majority of antibody responses would be expected to be well-defined with the homologous titer being higher than any of the heterologous titers.

Because the antibody response in dogs is con-

TABLE 2—Tabulation of Blood Scrum Titers for Leptospirosis and Concurrent Attempts at Isolation of Leptospires from Urine of 2 Dogs

Dog			Serum antibody titer		Result of urine isolation attempt
	Sample Date	L. pomona	L. ictero.	L. canico!a	
A	2-3-60	640	40	80	Neg.
	2-7-60	320	40	20	Neg. Neg.
	2-19-60	80	20	Neg.	Neg.
	2-23-60	80	40	10	Neg. Neg. Neg.
	3-3-60	80	40	Neg.	Neg.
	3-3-60 3-11-60	80	40	Neg.	Neg.
B	1-7-60	80	10	Neg.	Neg. Neg.
83	1-11-60	80	10	Neg.	Neg.

old, which were purchased by the State University of Iowa, College of Medicine, for experimental purposes. Although the origin of dogs was not known definitely, it is estimated that at least 80 per cent of these were from rural Iowa. County of origin and age were recorded for each dog.

Subsequent to arrival at the University Animal House, blood specimens were obtained by venipuncture of the cephalic vein. Serums from the blood specimens were screen-tested for leptospirosis by the Stoenner macroscopic plate agglutination test¹⁰ at a 1:2 dilution. Positive specimens were titered to end point (starting at 1:10 and using doubling dilutions to end point, i.e., 1:10, 1:20, 1:40, etc.) by a modification¹⁵ of the Freeman⁷ drop method. Commercially prepared antigens²⁰ of the L. pomona, L. icterohaemorrhagiae, and L. canicola serotypes were used.

Dogs with a titer of 80 or higher were arbitrarily chosen for additional study, which included further serologic tests and attempts at isolation of leptospires from urine. Urine specimens were obtained by catheterization and were inoculated into Fletcher's medium. The inoculum was prepared from urine by making immediate serial tenfold dilutions from 1:10 to 1:1,000,000 using sterile Sorensen's buffered saline solution. Final isolation attempts were made by the Veterinary Public Health Laboratory Unit, Communicable Disease Center, Chamblee, Ga. Isolation attempts of this nature have been successful, using freshly obtained bovine and human urine specimens."

On the basis of experience with human leptospirosis, wherein classical paradoxical reactions in all graduations have been encountered, it appears that such reactions occur early in the course of infection. The heterologous antibody levels fall to insignificance or become undetectable sooner than the homologous antibody. Therefore, in doing a serologic survey of apparently healthy dogs, one would not expect to en-

sidered similar to the response in man, in regard to paradoxical reactions, these data are classified according to primary reaction.

Results

The blood serums of 20 dogs that had previous contact with Leptospira-infected persons were tested. No evidence of leptospiral antibodies was found. These dogs were not included in the survey tabulations because of their selective environmental origin.

Of the blood specimens from the 354 dogs purchased for research purposes, 28 or 7.9 per cent were positive on the screening test. Results are summarized (table 1).

From the survey group, 2 dogs with serum titers of 80 or greater for one of the leptospiral serotypes were selected for further study. Serums from both appeared to give a positive reaction primarily for *L. pomona*. The results of further blood studies and concurrent urine isolation attempts on the 2 dogs are given (table 2).

Based on a primary serum titer of 40 or greater as indicative of dogs with positive serologic reactions, the following proportions may be extrapolated from the survey data: L. pomona, 2.0 per cent; L. canicola, 0.6 per cent; and L. icterohaemorrhagiae, 0.0 per cent.

Discussion

The majority of titers obtained were of relatively low magnitude (table 1). A se-

^{*}Fort Dodge Laboratories, Inc., Fort Dodge, Iowa.

TABLE 3—Comparison of the Iowa Canine Leptospirosis Survey with 5 Other Surveys on Dogs

	No. dogs	Percentages of positive samples			
Study	rested	L. pomona	L. ictero.	L. canicola	
Iowa	354	2.0	0.0	0.6	
Dolowy-Chi.6	311	0.5	22.0	14.8	
Dolowy-S.S.	348	1.1	11.2	15.2	
Murphy ¹¹	357	0.0	2.0	3.9	
Sanders ¹⁴	113	2.7	13.3	16.8	
Alexander ¹	279	0.7	2.5	27.6	

rum titer of 40 has been interpreted as a reflection of a low Leptospira antibody level in canine serum. Assuming a positive reaction at a dilution of 1:40 or greater as indicative of infection, the incidence of leptospirosis in dogs was found to be as follows: L. pomona, 2.0 per cent; L. canicola, 0.6 per cent; and L. icterohaemorrhagiae, 0.0 per cent. A comparison of results of this survey with those of 5 others is given (table 3).

One study surveyed 2 groups of normal dogs, 1 group from Chicago, Ill., area and 1 group from several southern states. These dogs were considered serologically positive if they had serum titers of 40 or greater, using the Stoenner capillary tube test.6,15 Another study of Leptospira antibody titers in "normal" dogs was made in Pennsylvania.11 Dogs from the New York City area under veterinary care, but none of them definitely suspected of having leptospirosis, have been surveyed.14 Clinically suspected or diseased dogs, including a limited number from areas where leptospirosis is enzootic, have been tested.1 In this instance, most of the serums tested were submitted by agencies located in the eastern section of the United States.

These last 3 groups were tested by the microscopic agglutination test, the first11 and third,1 using live antigens,8 and the second,14 using formalinized antigen.13,15,19 A serum titer of 100 or greater was accepted as evidence of a positive serologic reaction. Variations in results may be more apparent than real (table 3). Consideration should be given to differences in animal sources and serologic procedures as possible factors contributing to this variation. Nonetheless, the low incidence of positive serologic reactions encountered in this survey suggests that dogs may be of little importance in epidemiologic and epizootiologic considerations of leptospirosis in Iowa.

Antigenic cross-reactivity by heterologous leptospiral serotypes is well-recognized. This phenomenon occurred regularly during this survey (tables 1 and 2).

Summary

A serologic survey of incidence of leptospirosis in 354 predominantly rural Iowa dogs was made. The incidence of serologically positive dogs was based on a macroscopic agglutination titer of 40 or greater for 3 serotypes of leptospires. Incidence of dogs serologically positive for Leptospira pomona was 2.0 per cent; for Leptospira canicola, 0.6 per cent; and for Leptospira icterohaemorrhagiae, 0.0 per cent. These results were compared with 5 other serologic surveys of dogs and definite variations were found. On the basis of this survey, dogs from Iowa were not considered to be important in the epizootiology or epidemiology of these 3 Leptospira serotypes.

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Unusual Bullet Wound in a Dog—Case Report

A German Short-Haired Pointer, was brought for treatment of wounds which were considered the result of a dog fight. A penetrating wound was found in the right ear, close to the head. There was another wound in the left lower leg. No bone injury had occurred. Routine therapy was administered.

About 3 weeks later, the dog was returned for further examination because a slight swelling had developed over the frontal region of the head on the median line, slightly above the level of the eyes. A radiograph was taken, and a .38-caliber bullet and its fragments were clearly shown (fig. 1).

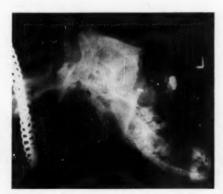


Fig. 1—Lateral r a d i ograph of dog's head with bullet lodged in frontal regions. Absence of clinical signs delayed diagnosis and corrective surgery 3 weeks.

Although the bullet had been lodged in the frontal bone for 3 weeks, no clinical signs had become apparent until this time. The bullet was removed with relative ease using pentobarbital sodium anesthesia.—J. O. Foss, D.V.M., Minot Veterinary Clinic, Minot, N.D.

Anemia in Hookworm-Infected Dogs

R. H. COHEN, V.M.D.

ANEMIA IN DOGS is especially serious in young pups. Anemia may be due to hemorrhage (internal or external), infectious hepatitis, leptospirosis, parasitism, chronic renal or hepatic diseases, or gastrointestinal disorders.² The term "anemia" is defined as a decrease in the amount of hemoglobin per unit of blood.¹

This report describes anemia occurring in pups shortly after birth or within the first 2 weeks of life as a direct result of hookworm infection. This report is also the evaluation of an injectable iron compound* and its effectiveness in raising the hemoglobin levels of anemic pups, as compared with the hemoglobin levels of the control pups.

TABLE 1—Hemoglobin Values of Anemic Beagle
Pups, 1 Day Old, 10 Days After Treatment with an
Injectable Iron Preparation

Treatment	Sex	Hemoglobin pretreatment (Gm./100 ml.)	Hemoglobin post-treatment —10 days (Gm./100 ml.)
Treated*	F	6.5	7.5
Treated	M	6.5	8.0
Treated	F	7.0	8.5
Control	F	7.0	Died - 5 days
Control	M	7.0	Died - 9 days

*12.5 mg. (0.25 cc.), Pigdex Injectable Iron, American Cyanamid Co., New York, N. Y.

A severe hookworm infection occurred on the permises of a breeding kennel in central New Jersey. Routine worming of all dogs, using standard anthelmintic products, was not effective. Bitches in breeding kennels were routinely treated with tetra-

TABLE 2—Hemoglobin Values of Anemic Cocker Spaniel Pups, 5 Days Old, 10 Days After Treatment with an Injectable Iron Preparation

Treatment	Sex	Hemoglobin pretreatment (Gm./100 ml.)	Hemoglobin post-treatment —10 days (Gm./100 ml.)
Treated	F	7.0	8.5
Treated	M	7.0	9.0
Treated	F	7.5	8.5
Control	F	8.5	8.5
Control	M	8.0	Died - 6 days
Control	F	7.0	Died - 10 days

chlorethylene, n-butyl chloride, and methylbenzene, but this treatment did not result in elimination of infection. Bitches which suckle large litters of pups frequently have anemia. Due to intrauterine infection, all pups which were born were infected with hookworms. The infection and consequent anemia were aggravated by environment through nursing since hookworms were present on the teats of the bitches as a result of unsanitary conditions.

Under such conditions, it was nearly impossible to raise pups to a saleable age in good physical condition.

TABLE 3—Hemoglobin Values of Anemic Dachshund Pups, 5 Days Old, 10 Days After Treatment with an Injectable Iron Preparation

Treatment	Sex	Hemoglobin pretreatment (Gm./100 ml.)	Hemoglobin post-treatment —10 days (Gm./100 ml.)	
Treated	F	7.0	Died — 3 days	
Treated	F	8.5	9.5	
Treated	F	9.0	10.5	
Treated	M	8.5	10.0	
Control	M	8.5	9.0	
Control	F	9.0	Died - 4 days	
Control	M	8.0	Died - 7 days	

Dr. Cohen is general practitioner in Lakewood, N.J.

**Pigdex Injectable Iron, American Cyanamid Co., New
York, N.Y.

TABLE 4—Hemoglobin Values of Anemic German Shepherd Dog Pups, 6 Days Old, 9 Days After Treatment with an Injectable Iron Preparation

Treatment	Sex	Hemoblobin pretreatment (Gm./100 ml.)	Hemoglobin post-treatment —9 days (Gm./100 ml.)
Treated	F	8.0	10.0
Treated	F	8.5	9.5
Treated	M	9.0	10.5
Treated	M	8.5	10.0
Control	M	9.0	Died - 6 days
Control	M	9.0	9.5

Since specific commercially available hookworm remedies and preventive measures were not effective, supportive therapy proved to be especially important. A hematopoietic agent to replace depleted iron was administered in the form of an injectable preparation. This therapeutic effort was important in aiding the pups to survive. Once the pups were approximately 4 weeks old, they were able to survive in the presence of hookworm infection.

Materials and Methods

Forty-one pups from 7 litters were selected at random for this investigation. Each pup was identified individually by a dye mark on a light-colored area of the coat. Each litter contained both control and treated pups (tables 1-7). During this period, a control group of 18 pups was maintained. The other 23 pups were given 0.25 cc. (12.5 mg.) of the injectable iron. All litters except a group of 4 pups were given only 1 treatment.

Each cubic centimeter of the injectable iron preparation contains a colloidal ferric oxide equivalent to 50 mg. of iron. It is a sterile solution recommended for the prevention and treatment of iron deficiency anemia in baby pigs.

Young pups which have not acquired any resistance to hookworm infection are most severely affected. When large numbers of hookworms mature, death may occur soon after the first signs of infection. This rapid death is due to the hemorrhage caused by hookworm infection in the intestines. Severely infected pups lose blood which is observed as a bloody or tarry diarrhea.

Hemoglobin levels were recorded for all pups before treatment and 8 to 10 days after treatment. On necropsy of the pups that died, severe hookworm infection was evident in the intestinal mucosa.

Hemoglobin levels were determined using a Spencer A-O hemoglobinometer.

Results and Discussion

The results of giving injectable iron to each litter are shown (tables 1-7). The 20 treated pups which survived had an increase in hemoglobin levels as follows: 5 increased 1.0 Gm./100 ml. of blood, 11 increased 1.5 Gm./100 ml. of blood, and 4 increased 2.0 Gm./100 ml. of blood. The pups given 2 injections had a further increase after the second treatment. Of the 7 surviving controls, 1 had no change and 6 had a rise in hemoglobin of 0.5 Gm./100 ml. Whereas 3 deaths were observed in the 23 treated pups, 11 deaths occurred among the 18 control pups. All pups were anemic before treatment.

All of the treated pups were given 12.5 mg. (0.25 cc.) of the injectable iron (50 mg. iron/cc.) intramuscularly.

One litter of pups (table 7) was given a second treatment with injectable iron at the 10-day post-treatment examination. At a second post-treatment examination (18 days after the first treatment), the treated pups had still higher hemoglobin levels.

It appeared that weight gains were increased in the treated pups when compared with the controls. Pups given injectable iron also appeared more thrifty and improved within a short time.

TABLE 5—Hemoglobin Values of Anemic Cocker Spaniel Pups, 8 Days Old, 8 Days After Treatment with an injectable Iron Preparation

Treatment	Sex	Hemoglobin pretreatment (Gm./100 ml.)	Hemoglobin post-treatment —8 days (Gm./100 ml.)	
Treated	F	7.0	Died — 2 days	
Treated	F	8.5	10.5	
Treated	F	7.0	8.5	
Treated	M	7.5	9.5	
Control	M	7.5	Died - 3 days	
Control	M	8.0	8.5	
Control	M	7.0	Died - 5 days	

TABLE 6—Hemoglobin Values of Anemic Cocker Spaniel Pups, 10 Days Old, 9 Days After Treatment with an Injectable Iron Preparation

Treatment	Sex	Hemoglobin pretreatment (Gm./100 ml.)	Hemoglobin post-treatment —9 days (Gm./100 ml.)	
Treated	F	8.0	9.5	
Treated	F	8.5	10.0	
Treated	F	8.0	Died - 6 days	
Control	M	8.5	9.0	
Control	M	8.5	9.0	
Control	M	8.0	Died - 5 days	

TABLE 7—Hemoglobin Values of Anomic German Shepherd Dog Pups, 6 Days Old, That Had Been Treated Twice, 10 and 18 Days After Treatment with an Injectable Iron Preparation

Treatment	Sex	Hemoglobin pretreatment (Gm./100 ml.)	Hemoglobin post-treatment —10 days* (Gm./100 ml.)	Hemoglobin post-treatment —18 days (Gm./100 ml.)
Treated	F	8.5	9.5	11.0
Treated	M	8.0	9.5	11.5
Control	F	8.0	8.5	9.0
Control	M	8.0	8.0	Died - 13 days

*Second treatment was administered at this time.

Since the completion of these studies, additional litters have been treated with simultaneous injections of the iron preparation and a specific antihookworm injectable drug.* More highly favorable responses were obtained when both drugs were used simultaneously for hookworm and anemia therapy, suggesting that injectable iron compounds cannot completely replace effective, specific anthelmintics, but that they may have value as supportive agents.

Summary and Conclusions

Clinical studies using an injectable iron preparation for treatment of anemia in pups are reviewed. A summary of these reports indicated that the anemia was caused by hemorrhage due to hookworm infection. Of the 23 treated pups, 3 (13.0%) died; of the 18 control pups, 11 (61.1%) died.

*DNP, American Cyanamid Co., New York, N.Y.

The 20 treated pups which survived had increased hemoglobin levels ranging from 1.0 to 2.0 Gm./100 ml. of blood. Of the 7 surviving controls, 6 had a rise of 0.5 Gm./100 ml. and 1 had no change. From our observations, the treated pups seemed to gain more weight and became more thrifty than the control pups which did not gain as rapidly, or remained runts.

The administration of the injectable iron compound was completely safe at the dosage level used, resulted in a rise in hemoglobin levels, and seemed to improve liveability in pups treated for anemia.

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Retained Pups and Pyometra

in a Bitch

C. A. HJERPE, D.V.M.

PYOMETRA is a common disease of older, unspayed bitches. This case of pyometra was unusual for 2 reasons: ordinarily, the bitch would have died 2 years before she did, at the time of her last whelping, when 3 pups were retained; second, she came in heat while she was carrying mummified pups and while she had pyometra.

History

The patient was a liver-and-white Springer Spaniel bitch, 4 years old. She had whelped several litters by liver-and-white males at 1 and 2 years of age and had had her last litter in March, 1958, by a black-and-white male. The last mating produced 6 black-and-white and 5 liver-and-white pups. Little could be learned from the owners about the circumstances surrounding the parturition, other than that the pups were born in a kennel. The bitch was in heat during the fall of 1958, the spring of 1959, and the fall of 1959, but was not bred.

She was first brought for examination on March 22, 1960. The owner stated that she was listless, partially anorexic, and had had polydipsia for 4 days. The owner had noticed a bloody vaginal discharge and attraction of male dogs, beginning on March 17, 1960.

On physical examination, there was marked injection of the conjunctivas, temperature of 102.4 F., a slight blood-tinged vaginal discharge (considered to be characteristic of proestrus), emaciation, and weakness. On abdominal palpation, a

slightly fluctuating mass with rounded posterior edges about the size of a grapefruit was found in the anterior abdomen. The main bulk of the mass extended anteriorly into the posterior thoracic region. An exploratory laparotomy was recommended, but the owner refused permission.

The dog was next seen on March 25, 1960, in a state of collapse and unable to rise; its temperature was 103.2 F. and vaginal discharge could not be detected. The mass in the abdomen appeared to have increased in size and was tender when palpated. The dog whined continuously. The total white blood cell count was 55,800/cmm. of blood, with approximately a 7:3 polymorphonuclear leukocyte: mononuclear leukocyte ratio.

This mass was diagnosed as a neoplasm with a necrotic center.

In an attempt to get the dog in condition for surgery, supportive treatment was initiated; it consisted of whole blood given intravenously, dextrose (5%), and physiologic saline solution with protein hydrolysate subcutaneously, and B complex vitamins, corticosteroids, and antibiotics given intramuscularly. She died on March 27, 1960, 2 days later, before recovering sufficiently for surgery.

Gross Pathologic Findings

Both uterine horns ended abruptly 1½ inches anterior to the uterine bifurcation. The vagina, cervix, and abreviated uterine horns were grossly normal in size and appearance. A ligamentous band of poorly defined connective tissue, about 6 inches long, connected the apex of the stump of the right uterine horn with a large mass in the anterior abdomen. The mass was shaped

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The author thanks Dr. T. Benson, New York State Veterinary College. Cornell University, Ithaca, N. Y., for histopathologic examination.

like a dilated canine stomach, being approximately 12 inches long and 6 inches in diameter, with a greater and a lesser curvature. It was suspended anteriorly by the right utero-ovarian ligament and suspensory ligament of the right ovary. Blood was supplied by the right utero-ovarian vessels. The mass was incised and found to contain about 1 liter of a thin, fetid, yellow-gray fluid and 3 black-and-white mummified fetuses.

The left ovary was suspended from the region of the posterior pole of the left kidney. The missing remnant of the left uterine horn was suspended from the left ovary by the utero-ovarian ligament, but was otherwise unattached. It was 8 inches in length and $1\frac{1}{2}$ inches in diameter, containing about 200 cc. of a fluid similar to that found in the larger isolated segment of uterus. The entire blood supply came from the left utero-ovarian vessels.

Histopathologic Findings

The ovaries and normal uterus were submitted for histopathologic study. Evidence of cystic hyperplasia, but no infection, was found in the segment of grossly normal uterus. Degenerating corpora lutea were found in the ovary. The latter finding tends to indicate that the attraction of male dogs and the blood tinged vaginal discharge may not have been symptomatic of an approach-

ing estrus. However, the former finding indicates that the discharge was not due to any genital infection.

Discussion

The cause of the detachment of the tips of the uterine horns from the rest of the uterus, and the retention of the 3 pups could not be determined. Perhaps a torsion of the uterus occurred during the last parturition, after the left horn had been emptied of pups. Both horns were evidently involved in the torsion, and the resultant restriction of blood supply in the area of the torsion was followed by necrosis and separation of the major portion of the uterine horns from the rest of the uterus.

The most unusual aspect of the case is the fact that the bitch survived this torsion. The case is also interesting because the bitch had had apparently normal heat cycles for 2 years following the retention of the 3 mummified pups.

It is not clear how the bacteria (the pus was not cultured) gained entrance to the completely isolated segments of uterus. Possibly infection had remained latent since the parturition 2 years previously. More likely the infection was hematogenous or lymphogenous, although it is not uncommon for pus to be bacteriologically negative at the time of surgery or necropsy.

Canine Eosinophilic Panostitis

A specific bone disease to which young German Shepherd Dogs have been susceptible since World War II is not caused by either aerobic or anaerobic organisms. The basic characteristic of the disease is a recurrent, transitory osteosclerosis of the tubular bones which does not involve the epiphysis.

The course of the disease is benign; it disappears by 20 months of age, at the latest, after a certain number of relapses.

The constant recurrence of the disease in a proportion of pups in every litter from certain sires and dams and the improvement of litters by exclusion of certain progenitors indicates the complexity of its cause in which heredity plays a significant role.

The disease was transmitted to 2 of 5 healthy Alsatian pups by inoculation into the medullary cavity of an unfiltered suspension of the bone marrow from a spontaneous case. A Seitz filtrate of similar material produced the disease within 2 weeks of inoculation in 2 of 3 healthy dogs. Three control pups inoculated with bone marrow suspension from a healthy dog developed no signs of the disease.—Zeskov in Sonderdruck aus Zentralbl. f. Vet.-med., 7, (1960): 671.

Hepatic Coccidiosis

in Domestic Rabbits Treated with 2

Nitrofuran Compounds and Sulfaquinoxaline

Karl W. HAGEN, JR., A.B.

PREVIOUS REPORTS have stated that nitrofurazone is valuable in controlling cecal coccidiosis in birds4 and hepatic coccidiosis in rabbits.7 Infected doe rabbits produced young that were free of hepatic coccidiosis when they were heavily medicated with nitrofurazone during pregnancy and lactation. After weaning, the young were kept free of infection by placing them on a high dosage regimen.6 Another nitrofuran compound, furazolidone, fed at the 0.0165 per cent level, reduced mortality and decreased the number of liver lesions in rabbits that had been experimentally infected with Eimeria stiedae. The prophylactic feeding of nitrofurazone to young rabbits prevented the signs of coccidiosis and reduced oocyst excretion so that massive reinfection was impossible.1

The previous research was concerned mainly with the ability of the nitrofuran compounds to reduce mortality, to lower oocyst excretion, and to enable the animals to resist large oocyst doses. The commercial rabbit grower who raises fryers, however needs a drug regimen for his rabbits that will prevent liver disfigurement and make the excreted oocysts infertile. The mortality from liver coccidiosis is generally not significant in hutch-raised rabbits, but the liver lesions prejudice the marketing of the entire carcass.

Sulfaquinoxaline has previously been reported as effective in preventing the liver lesions of hepatic coccidiosis. 3.5.8 The experiments reported here were designed to compare the effectiveness of (1) nitrofurazone, (2) furazolidone, and (3) sulfaqui-

noxaline in preventing liver lesions and rendering excreted oocysts infertile in experimentally-infected animals.

Materials and Methods

Thirty-six New Zealand White rabbits, weighing 3.9 to 4.3 lb. and taken from litters free of E. stiedae infection, were used. They were allotted to groups of 6, and placed in clean all-metal hutches. The ration was hopper-fed, with minimal fecal contamination. Water was furnished by a "dewdrop" system, except for some rabbits that were supplied with medicated water in crocks.

In the first experiment, 6 rabbits were used as controls and 6 for tests. The test rabbits were fed a standard rabbit pellet supplemented with 0.011 per cent furazolidone, whereas the control rabbits were fed the standard pellet without medication. Approximately 10,000 sporulated oocysts of E. stiedae were deposited into both control and test rabbits' stomachs, with a soft rubber catheter. Two test rabbits were given the medicated pellets 3 days before the oocysts were administered, 2 were given the pellets at the time of administration, and 2 were given them 3 days afterward. Twenty-four days after the oocysts were administered, the rabbits were killed and examined for liver infection.

In the second experiment, 6 rabbits were used as unmedicated controls and 18 for tests. The test rabbits were allotted to 3 groups and given medication in water as follows: 6 each were given 1.5 Gm. of nitrofurazone per liter of water, 6 each were given 4.0 Gm. of nitrofurazone combined with furazolidone per liter of water, and 6 each were given 0.3 Gm. of sulfaquinoxaline per liter of water. Approximately 20,000 sporulated oocysts were deposited into the stomachs of both test and control rabbits with a soft rubber catheter. In each test lot of 6 rabbits, the medicated water was supplied so that 2 rabbits were given the medication 2 days before the oocysts were administered, 2 were given it at the time of administration, and 2 were given it 2 days afterward. Sixteen days after the oocysts were administered, half the rabbits were killed and examined for liver lesions. The remainder were killed on day 22 following oocyst administration.

Liver weight percentage (liver/dressed carcass), which is an expression of the severity of the infec-

From the U.S. Rabbit Experiment Station, Animal Disease and Parasite Research Division, USDA, ARS, Fontana, Calif.

Hess and Clark, Inc., Ashland, Ohio, supplied the following drugs used in these experiments: nitrofurazone, nitrofurazone combined with furazolidone, and furazolidone feed additive. Merck and Co., Inc., Rahway, N.J., supplied the sulfaquinoxaline.

tion, was determined on all rabbits. Gallbladder contents were examined microscopically to evaluate the drugs' ability to render the oocysts infertile.

Results

In the first experiment, the use of 0.011 per cent furazolidone in the ration was not effective in preventing infection with oocysts of *E. stiedae*. The test rabbits, as well as the controls, had numerous lesions uniformly dispersed throughout the liver. The gallbladders were filled with oocysts and the bile tracts were enlarged and distorted. Normal, fertile oocysts were found in the gallbladder and cecal contents.

In the second experiment, the addition of sulfaquinoxaline to the drinking water prevented the formation of liver lesions. With the exception of 1, the nitrofurantreated rabbits had numerous lesions of the liver. Liver lesions were numerous in the control rabbits. Liver lesions were well established by postinoculation day 16 and were advanced by day 22, as indicated by the proportion of liver weight to dressed carcass weight. The weight of the livers ranged from a low of 7.2 per cent in the sulfaquinoxaline lot to a high of 54.4 per cent of the weight of the dressed carcass in the control and nitrofurazone lots.

With the exception of 1 rabbit, and it had infertile forms, oocysts were not found in the bile tracts of those rabbits given sulfaquinoxaline-medicated water. The oocysts examined in the bile of those rabbits given nitrofurazone-treated water were predominantly normal, with only a few infertile forms present. However, in the rabbits given nitrofurazone combined with furazolidone, there were fewer normal oocysts and many more infertile ones. One rabbit in this lot had only infertile oocysts in the bile tract.

Discussion

100

The nitrofuran compounds did not prevent the development of liver lesions in experimentally-infected rabbits, although the differences in the liver weights suggested that the compounds interfered with the life cycle of the parasite and lowered viable oocyst excretion. At postinoculation day 16, the average percentage of liver weight was similar in both the nitrofuran-treated and control lots. By postinoculation day 22, however, the average liver weight of the controls exceeded that of the nitrofuran-

treated rabbits by 20 per cent. The results also suggested that the combination of nitrofurazone and furazolidone had a detrimental effect on the production of the microgametocytes, judging by many infertile occysts in the bile tracts.

The presence of infertile oocysts in the bile of 1 rabbit in the sulfaquinoxaline lot indicated that sporogony and schizogony had been completed; however, infertile oocysts cannot infect other animals. The absence of visible lesions in the rabbits medicated with sulfaquinoxaline-treated water would make the livers marketable and would not prejudice the value of the entire carcass.

Summary

1) Sulfaquinoxaline in the drinking water prevented the development of visible liver lesions due to *Eimeria stiedae* and interfered with the life cycle by causing the parasite to produce infertile forms.

2) Two nitrofurans, nitrofurazone and furazolidone, used separately and in combination, did not prevent the development of liver lesions in domestic rabbits experimentally infected with E, stiedae.

3) Nitrofurazone and furazolidone administered in combination had a detrimental effect on the life cycle of *E. stiedae* by causing the parasite to produce many infertile forms in the bile tracts.

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Editorial

Pets or Companions?

Some veterinarians seem inclined to use the terms "companion animals" and "companion animal medicine" in an effort to more clearly designate a group of animals requiring veterinary care. One such person feels that horses should be classed as companion animals because so many of them are now owned and ridden for pleasure, are not basically food-producing animals, and are not today so closely associated with agriculture or the "livestock industry." Another believes that tame exotic animals should be classed as companion animals because they can be treated as patients in a manner different from the captive wild members of the species and are regarded as pets by their owners. Still another person includes laboratory animals because these are sometimes owned as pets, are so treated by practitioners, and are housed in facilities having some of the characteristics of small animal hospitals.

Would acceptance of the new terms presage a new definition of practice activities or specialties? Would the large animal practitioner who now lists himself as such need to signify that he also treats horses? Would the practitioner who now restricts his practice to small animals or pets need to indicate his willingness to engage in equine practice as well? Would we someday have doctors of companion animal medicine owning companion animal hospitals?

There was a time when most people correctly considered the veterinarian to be a person who treated horses. Then, with the decline in horse numbers and the coincidental achievement of a high level of professional competence to meet demands for other types of service, the public conception of the veterinarian broadened and he became recognized as a medical authority concerned with all species of lower animals. Terms like "general veterinary practice," "large animal practice," or "small animal practice" have caused no appreciable public concern or bewilderment; in fact, they've served their purpose nicely.

Physicians, with their practices limited to one species, specialize by regions or organs of the body (proctology, opthalmology), age of the patient (pediatrics, geriatrics), or special skill (surgery, radiology). The accumulation of knowledge in each specialty requires this type of concentration. With respect to veterinary medicine, in which practice restriction is still pretty much by species, it would appear logical to narrow the species interest rather than broaden it

Veterinary medicine has done exceedingly well under its own name and those of its well-known types of services. It has managed to serve both agriculture and medicine without surrendering its own identity. Before we adopt the term companion animal medicine as a division of veterinary medicine, let's be sure it's needed—that we know just what it means, and that others will too.

Canada Ranks Twelfth in World Veterinary Population

In Canada, there are 2,051 veterinarians according to the 1959 FAO Animal Health Yearbook and 2,200 according to the Annuaire du Canada, 1958. Using either figure, Canada ranks twelfth in the world in numbers of veterinarians. In a recent editorial, "The World Veterinary Force" (J.A.V.M.A., Nov. 15, 1960), Canada was inadvertently omitted from the list of the 20 leading countries in veterinary population.

from the Research Journal

Cartilaginous Tumors

In the animals studied, 80 per cent of the cartilaginous tumors occurred in sheep. Ninety per cent of the tumors were histologically malignant, but only 40 per cent were grossly metastatic or invasive. The most common tumor in animals appears to be chondrosarcoma in sheep.—[D. J. Sullivan: Cartilaginous Tumors (Chondroma and Chondrosarcoma) in Animals, Am. J. Vet. Res., 21, (July, 1960): 531-535.]

New Feline Viruses

The feline respiratory disease syndrome is complicated by the isolation from clinically ill cats of a number of viruses that are cytopathogenic for feline kidney tissue culture cells. The majority of these viruses have been isolated from the upper respiratory tract or conjunctiva by investigators from different laboratories throughout the country. Studies were made to determine their serologic relationship by re-

ciprocal cross-neutralization tests in tissue culture. Of 23 viruses studies, 9 were shown to be new serotypes, 8 were related to Crandell's C-27 agent, and 6 were not identified. —[J. L. Bittle, C. J. York, J. W. Newberne, and M. Martin: Serologic Relationship of New Feline Cytopathogenic Viruses. Am. J. Vet. Res., 21, (July, 1960): 547-550.]

External Ear of the Cat

The ear of the cat is divided into 2 parts, the pinna and the external auditory meatus. The pinna cartilage is characterized by oval scapha foramina transversed by blood vessels.

The epidermis of both regions is usually composed of only 4 layers, all thin. The stratum lucidum is rarely present. A few mitotic figures are present in the stratum cylindricum.

The dermis of the pinna is thin and increases in thickness from the pinna tip to the auditory canal. Both convex and concave sides contain sweat and sebaceous glands with short, crowded, excretory and secretory units. Hair distribution is usually dense on the convex side and sparse, except toward the rostral border, on the concave side.

The dermis of the external auditory

meatus has both a stratum papillare cutis and a stratum reticulare, but the fiber arrangement is occasionally altered by size and number of glands present in the ear canal. The fibers of the stratum papillare cutis are small and similar to those in the hairy skin. The stratum reticulare becomes dense as it fuses with the perichondrium of the cartilage. Elastic fibers appear larger and more numerous in the lower third of the meatus.

Sebaceous glands measure 200 to 450 μ in diameter and sometimes occur independently of hair follicles. Ceruminous glands occur throughout the auditory canal. —[J. H. Strickland and M. L. Calhoun: The Microscopic Anatomy of the External Ear of Felis domesticus. Am. J. Vet. Res., 21, (Sept., 1960): 845-850.]

Studies on a New Feline Virus

California feline isolate (CFI), a new cytopathogenic agent, was isolated from a clinicaly ill cat having signs of a respiratory infection. A serologic comparison of CFI to the virus of feline pneumonitis (Baker), kidney cell degenerating virus, the Bolin virus, and feline viral rhinotracheitis shows that it is not related antigenically to any of these. Results of the transmission studies support the hypothesis that this agent, under proper conditions, is capable of producing a clinical disease in susceptible animals.

However, loss of virulence for experimental cats was found to occur between the twelfth and 30th tissue culture passage without loss of antigenicity. The CFI virus can be readily lyophilized and can be stored at -20 C. and -60 C. for at least 18 months with little loss of infective titer. -[R.~A.~Crandell~and~S.~H.~Madin:~Experimental Studies on a New Feline Virus. Am. J. Vet. Res., 21, (July, 1960): 551-556.]

Ecologic Considerations in Turkey Ornithosis

Two strains of ornithosis agents isolated from turkeys in California were found to differ markedly in their infectivity and pathogenicity for turkeys and pigeons.

In replicated experiments on the transmission of ornithosis, it was shown that pigeon ornithosis agents were transmitted from pigeons to turkeys during pen contact and that the infectious agent multiplied in the turkey host sufficiently to stimulate antibody production. The agent was excreted by the turkeys and was transmitted

in turn to alternate susceptible turkeys placed in pen contact with turkeys originally exposed to infected pigeons.

Serologic tests, employing group-sensitive and strain-sensitive antigens on turkey serums collected at intervals during the test, suggested that antigenic changes in the infectious agent occurred after the agent had multiplied in the turkey host.

—[L. A. Page: Ecologic Considerations in Turkey Ornithosis. Am. J. Vet. Res., 21, (July, 1960): 618-623.]

Uterine Biopsy Technique

Five cows were inoculated in utero with virulent Vibrio fetus culture. Two cows were treated during the first 16 hours of estrus, 2 in the middle of the estrous cycle, and 1 during the last part of the cycle. After inoculation, cervical mucus was collected and duplicate uterine biopsy specimens were obtained from each cow every 5 days. The isolations were examined for catalase activity. Four cows become infected, and catalase-positive V. fetus could be isolated during the 120-day experimental period.

One biopsy specimen was ground and cultured, and the other was used for histologic

examination. The major changes in the endometrium were slight to marked degeneration of the surface epithelium and moderate to marked polymorphonuclear and lymphocytic infiltration of the stroma. These changes started 5 days after inoculation, reached a peak between the 30th and 60th days, and persisted to a lesser degree until the end of the experiment at 120 days.—[L. Dozsa, N. O. Olson, and A. Campbell: The Uterine Biopsy Technique for Following the Histologic Changes Caused by Vibrio fetus in the Uterine Mucosa. Am. J. Vet. Res., 21, (Sept., 1960): 878-883.]

Parasite Survival on Pasture

At College Station, Texas, the survival on pasture of infective larvae was determined for Cooperia pectinata in 7 trials and for Ostertagia ostertagi in 5 trials. The maximum length of survival was 138 days for C. pectinata and 144 days for Ostertagi. The maximum time required for

50 per cent of the larvae to die was 46 days for *C. pectinata* and 36 days for *O. ostertagi.*—[R. R. Bell, T. J. Galvin, and R. D. Turk: Survival on Pasture of Infective Larvae of Cooperia pectinata and Ostertagia ostertagi. Am. J. Vet. Res., 21, (Nov., 1960): 1101-1103.]

-New Books -

Anatomy and Histology of the Eye and Orbit in Domestic Animals

The veterinarian interested in opthalmology, whether he be clinician, teacher, or engaged in research, will find this book invaluable. It will be of especial use to those

performing ocular surgery.

The authors have fulfilled a real need for a reliable treatise on the anatomy of the eye and orbit in the dog, cat, horse, cow, sheep, pig, goat, and rabbit. Each species is dealt with individually, and the histologic and anatomic descriptions are presented in a most concise, systematic manner. The description of each includes the orbit, extraocular muscles, glands, globe, eyelids, vascular system, and neurologic system. There

is, in addition, considerable information concerning the physiology of the eye.

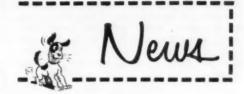
The book is profusely and beautifully illustrated and is most interesting and easy to read. By means of histologic illustrations, many misconceptions concerning the anatomy of the canine eye have been corrected, and a wealth of new information included.—[Anatomy and Histology of the Eye and Orbit in Domestic Animals. By Jack H. Prince, Charles D. Diesem, Irma Eglitis, and Gordon L. Ruskell, 307 pages; illustrated. Charles C Thomas, Springfield, Ill. 1960. Price \$15.75.]—W. E. Magrane.

Advances in Virus Research

This volume maintains the same high quality of the previous volumes. Of particular interest to those in the field of animal virology are the chapters on "The Virus of Foot-and-Mouth Disease," by J. B. Brooksby, England (Immunological Types, the "Variant" Strains or Subtypes, Species Adaptation, Titration of the Virus, Virus and Antiserum, Multiplication of the Virus, Active Immunity, and Biophysical Studies); "Psittacosis-Lymphogranuloma Group of Viruses," by H. A. Wenner (Host-Parasite Relationships and Human and Animal P-LV Viruses); "The Measurement of Complement Fixation by Viruses," by F. Fulton (General Principles, the Parameters, the Variables, Contour Representation, Comparison of Sera, Comparison of Antigens); and "Mechanism of Hemagglutination by Influenza Virus," by A. Buzzell and M. Hanig.

The other chapters are "Mating in the Reproduction of Bacterial Viruses," by G. S. Stent; "Lysogeny," by G. Bertani; and "The Hereditary Virus of Drosophila," by Ph. L'Heritier.

Those interested in the subject matter presented in the various chapters of this volume of Advances in Virus Research will find it to be useful and informative. All chapters are well written and contain a great deal of information secured from many publications throughout the world. The reviewer is greatly impressed with this volume and recommends it to those interested in this field of virology.—[Advances in Virus Research. Vol. 5. Edited by Kenneth M. Smith and Max A. Lauffer. 376 pages; illustrated. Academic Press, Inc., 111 Fifth Ave., New York 3, N.Y. 1958. Price \$9.50.]—C. H. Cunningham.



Mr. Heinz R. Kuehn, New AVMA Director of Public Information

Mr. Heinz R. Kuehn, former acting director of the Bureau of Public Information, American Dental Association, has been appointed AVMA director of public information. He began his employment with AVMA Jan. 2. 1961.

Mr. Kuehn had been acting director of the Bureau of Public Information, American Dental Association, since July, 1960. He had joined ADA as assistant director of the Bureau in 1959.

Some of his responsibilities at the American Dental Association were to initiate and assist in the development of national radio and television progams on dental health and dentistry, assist state and local dental societies in the development of public relations progams, direct operation of the press room and arrange press conferences during ADA's annual sessions, maintain liaison with and supply information to national consumer magazines and health publications, and prepare promotional material for the American Dental Association.

From 1956 to 1959, Mr. Kuehn was employed by the Portland Cement Association's Bureau of Public Relations as a staff writer and publications editor. In this position he wrote articles for national consumer magazines and trade journals, and prepared news releases, film scripts, and major public relations publications.

Mr. Kuehn has worked as a free-lance writer, newspaper reporter, editor of a weekly paper, and radio commentator. He is the author of many newspaper and magazine articles, essays, and reviews which have appeared in both American and European publications. He is also the author of three books.



Mr. Heinz R. Kuehn

A native of Bern, Switzerland, Mr. Kuehn received his Bachelor of Arts degree in Berlin, Germany, in 1938, and did postgraduate studies at the universities of Berlin and Tuebingen. His wife, Regina, was a director of public information at the state library in Berlin. The Kuehns, with their three daughters and two sons, reside in Oak Park, Ill., a Chicago suburb.

Special Training Program for Steroid Biochemistry Planned

Specialized programs have been established to train investigators in the theoretical and methodological aspects of the biochemistry of steroids and related compounds at Worcester, Mass., and Salt Lake City, Utah, under the sponsorship of the National Cancer Institute, N.I.H., U.S. Public Health Service. Each program includes lectures, planned laboratory work, and research. Classes will begin Oct. 1, 1961.

Postdoctoral candidates (M.D. or Ph.D.) selected for admission at Worcester and Salt Lake City will receive stipends of \$5,500 for a one-year period. Predoctoral candidates (B.S., M.S., or equivalent) selected for admission at Worcester will receive stipends of \$1,800 for a 6-month period.

Inquiries and requests for applications can be sent before June 1, 1901, to Dr. Kristen Eik-Nes, Department of Biochemistry, College of Medicine, University of Utah, Salt Lake City, Utah, or Dr. William R. Nes, Department of Chemistry, Clark University, 950 Main St., Worcester, Mass.

Veterinary School Enrollment and Faculty Changes, 1960-1961

Student enrollment at the schools and colleges of veterinary medicine in the United States and Canada has reached an all-time high.

Total enrollment for the 1960-1961 school year at the 20 U.S. and Canadian veterinary schools is 3,832. Last year's total enrollment was 3,778.

Here are the enrollment figures for the past six years:

1955-1956	3,732
1956-1957	3,754
1957-1958	3,797
1958-1959	3,751
1959-1960	3,778
1960-1961	3.832

There are 1,095 freshman veterinary students at the 20 schools. This is another high enrollment figure. It is 39 students over last year's total of 1,058 first year students. These 1,095 students represent 52 per cent of qualified applicants to veterinary schools for the 1960-1961 school year.

Of the 1,095 first-year veterinary students, 111 have had 5 years of professional work, 208 have had four, 256 have had three, and the remainder have had two years of preprofessional work with some exceptions. Applicants to Canadian schools may enter without 2 years of preprofessional work providing they can satisfy specific entrance requirements. A total of 283 first-year stu-

Veterinary Student Enrollment for the Academic Year 1960-1961

Schools		Soph.	Jun.	Sen.	Total			
	Fresh.				1961	1960	Spec.	Grad.
Auburn University	55	51	64	54	224	218	-	10
California, University of	51	46	49	49	195	197	3	17
Colorado State University	71	67	61	61	260	261	2	18
Cornell University	60	58	57	52	227	219		29
Georgia, University of	58	47	58	56	219	227	**	1
Illinois, University of	48	33	35	36	152	155	1	37
Iowa State University	73	59	61	62	255	248	1	28
Kansas State University	69	64	59	65	257	261	1	29
Michigan State University	64	56	56	60	236	246		33
Minnesota, University of	46	48	35	43	172	176	4.5	51
Missouri, University of	30	27	31	25	113	115	5	
Ohio State University	74	70	68	67	279	273	-	21
Oklahoma State University	43	42	32	35	152	152	4	6
Ontario Veterinary College®	76	63	46	49	234	211	2	15
Pennsylvania, University of	57	45	46	48	196	192	2	16
Purdue University	50	45		****	95	50	2	18
Quebec School of Veterinary								
Medicine®	36	23	27	15	101	103	_	-
Texas, A. & M. College of	66	54	51	50	221	222	1	16
Tuskegee Institute	19	11	11	17	58	68		-
Washington State University	49	48	45	44	186	184		9
TOTAL	1,095	957	892	888	3,832	3,778	24	354

^{*}First year not included.

Residence of Freshman Veterinary Students in the United States and Canada

Alabama	17	Mississippi	6	West Virginia	4
Alaska		Missouri	33	Wisconsin	19
Arizona	10	Montana	15	Wyoming	4
Arkansas	4	Nebraska	20	wyoming	
*California	2	Nevada	1	Alberta	14
Colorado	37	New Hampshire	4	British Columbia	6
Connecticut	3/	New Jersey	19	Manitoba	5
	1		19	New Brunswick	
Delaware	1	New Mexico	2		****
District of Columbia	1	New York	47	Nova Scotia	1
Florida	18	North Carolina	11	Ontario	28
Georgia	25	North Dakota	7	Prince Edward Island	1
Hawaii		Ohio	68	*Quebec	1
Idaho	7	Oklahoma	22	Saskatchewan	22
Illinois	50	Oregon	3		
Indiana	48	Pennsylvania	33		
Iowa	48	Rhode Island		British Guiana	1
Kansas	45	South Carolina	9	British West Indies	î
Kentucky	13	South Dakota	8	Finland	1
Louisiana	12	Tennessee	9	Ghana	1
Maine	1	Texas	57	India	- 1
Maryland	16	Utah	7	Nigeria	
Massachusetts		Vermont	,		1
	9	Virginia	6	Puerto Rico	7
Michigan	44		9	Vietnam	2
Minnesota	38	Washington	19	West Indies	1

^{*}The University of California and the Quebec School of Veterinary Medicine did not supply freshman residence information.

dents have advance degrees — 255 have B.S. or B.A. degrees and 28 have M.S. or M.A. degrees. No first-year students were reported to have Ph.D. degrees.

Veterinarians performing graduate studies at veterinary schools total 354. Last year there were 288 veterinarians doing graduate work and ten years ago there were only about 130.

There are 137 women enrolled in the 20 veterinary schools reporting — 56 first-year students, 36 second-year students, 22 third-year students, and 23 fourth-year students. Seven women are performing graduate work.

Auburn University

New appointments at the school of Veterinary Medicine, Auburn University, are as follows: Drs. C. W. James (AUB '54), assistant professor, Department of Anatomy and Histology; R. P. Crawford (TEX '57), assistant professor, Department of Bacteriology; J. R. Lindsey (GA '57), assistant professor, Department of Pathology and Parasitology; C. L. Holloway (AUB '49), instructor, Department of Anatomy and Histology: W. R. Miller (AUB '50), instructor, Department of Bacteriology; Patricia Teer (AUB '59), instructor, Department of Pathology and Parasitology; D. L. Diamond (ONT '35), instructor, Department of Pathology and Parasitology; J. C. Woodard (AUB '58), instructor, Department of Pathology and Parasitology; and C. E. Hunt (WSU '59), instructor, Department of Small Animal Surgery and Medicine.

California, University of

During the past year the School of Veterinary Medicine, University of California, Davis, established official departments. Eight of these departments are academic departments of teaching and research. The Department of Veterinary Services is responsible for laboratory animal procurement, breeding care, and housing as well as certain central laboratory services.

The chairmen of these departments are: Dr. D. R. Cordy (ISU '37), Department of Pathology; J. R. Douglas, B.S., Ph.D., Department of Microbiology; L. M. Julian (WSU '46), Department of Anatomy; J. W. Kendrick (COR '47), Department of Medicine, Surgery, and Clinics; B. McGowan, Jr. (CAL '52), Department of Veterinay Services; S. A. Peoples, M.D., Department of Pharmacology, Physiology, and Biochemistry; L. G. Raggi (PER '44), Department of Avian Medicine; W. W. Sadler (TEX '39), Department of Public Health; and

O. W. Schalm (MSU '32), Department of Clinical Pathology.

Promotions in the past year went to: Drs. Harold R. Parker (CAL '52), assistant professor, Department of Pharmacology, Physiology and Biochemistry; Jiro Kaneko (CAL '56), assistant professor, Department of Clinical Pathology: Norman F. Baker (CAL '52), associate professor, Department of Microbiology; Ernst Biberstein (COR '52), associate professor, Department of Microbiology; and Larry Z. McFarland (CAL '56), assistant professor, Anatomy Department.

New faculty members at the University of California are: Drs. Richard A. Freedland, Ph.D., lecturer in biochemistry, Department of Pharmacology, Physiology and Biochemistry; William P. C. Richards, M.V.Sc. (ONT), specialist, Department of Pathology; Edward J. Carroll, Ph.D., specialist, Department of Clinical Pathology; John H. Reed (ONT '55), lecturer, Small Animal Division, Department of Medicine, Surgery and Clinics: J. D. Bergevin, (WSU '60), Herman Bonasch (MSU '60), Q. W. Bosworth, (MSU '60), Richard Miles (CAL '60), and J. S. Browne (ONT '60), specialists, Department of Medicine, Surgery and Clinics: Moshe' Shifrine, Ph.D., specialist, Department of Avian Medicine.

DR. D. R. CORDY APPOINTED CHAIRMAN, DEPARTMENT OF PATHOLOGY.—Dr. D. R. Cordy was appointed chairman of the University of California's Department of Pathology on July 1, 1960.

He has been a member of the California School of Veterinary Medicine faculty since 1950. He had previously served as professor of veterinary science and pathologist at the Experiment Station. Dr. Cordy received his Ph.D. degree from Cornell University in 1940. From 1940 to 1942 and from 1946 to 1950 he was a pathologist at the State College of Washington. He served in the Veterinary Corps of the U. S. Army from 1942 to 1946.

DR. JAMES R. DOUGLAS IS CHAIRMAN, DE-PARTMENT OF MICROBIOLOGY.—Dr. James R. Douglas is the chairman of the University of California's Department of Microbiology.



Dr. James R. Douglas

He received his B.S. degree in 1935 and his Ph.D. degree in 1939 from the University.

Dr. Douglas has been a member of the University of California faculty since 1946. He is a professor of parasitology. He worked on tropcial disease control while in the U.S. Navy from 1942 to 1946. From 1940 to 1942 Dr. Douglas studied transmission of plague at the George Williams Hooper Foundation for Medical Research, University of California Medical Center, San Francisco.

DR. LOGAN M. JULIAN APPOINTED CHAIRMAN, DEPARTMENT OF ANATOMY.—Dr. Logan M. Julian was appointed chairman of the Department of Anatomy on July 1, 1960. He received his Ph.D. degree from the University of California in 1951.

Dr. Julian has been employed by the University since 1946. He has been an associate in the Experiment Station (1946-48), an associate in veterinary anatomy and in the Experiment Station (1948-49), a lecturer and assistant specialist in the Experiment Station (1949-51), an assistant professor of veterinary science and an assistant anatomist in the Experiment Station (1951-56), and an associate professor of veterinary science and associate anatomist in the Experiment Station from 1956 to present.

Dr. Julian's major research interests have been functional comparative anatomy of



Dr. Logan M. Julian

domestic animals, anatomical bases of genetic and environmental influence upon growth, neoplasia, and the reticuloendothelial system in relation to liver function.

Dr. S. A. Peoples Appointed Chairman, Department of Pharmacology, Physiology and Biochemistry.—On July 1, 1960, Dr. S. A. Peoples was appointed to head the University of California Department of Pharmacology, Physiology and Biochemistry.

Dr. Peoples received his M.D. degree from the University of California in 1934. Following his graduation he had a Merck Fellowship in Pharmacology and then, in 1935, went to Maudsley Hospital in London, England, as a Commonwealth Fellow in Psychiatry where he studied the pharmacological effects of amphetamine.

Returning to this country, he became assistant professor of physiology and pharmacology at the University of Louisville, Ky. In 1938 he became associate professor of physiology and pharmacology at the University of Alabama School of Medicine. In 1943 he became professor of pharmacology at Baylor University School of Medicine in Houston, Texas. He joined the University of California faculty at Davis as professor of comparative pharmacology and toxicology

with the School of Veterinary Medicine in 1947. Dr. Peoples still holds this position.

DR. BLAINE McGowan, JR., New Chairman, Department of Veterinary Services.—Dr. Blaine McGowan has been named the chairman of the University of California's Department of Veterinary Services. He became an associate professor and associate



Dr. Blaine McGowan, Jr.

veterinarian in July, 1960. Dr. McGowan, who teaches in the Department of Medicine, Surgery and Clinics, has studied sheep diseases. He received his D.V.M. degree from the University of California in 1952.

DR. JOHN W. KENDRICK NAMED CHAIRMAN, DEPARTMENT OF MEDICINE, SURGERY AND CLINICS.—Dr. John W. Kendrick was named the chairman of the Department of Medicine, Surgery and Clinics on July 1, 1960.

Dr. Kendrick joined the staff of the School of Veterinary Medicine, University of California, in 1950. Prior to his appointment as department charman, he was in charge of the ambulatory division of the department. His teaching and research have covered several phases of large animal practice but have primarily centered around diseases of the reproductive organs.

Dr. Livio G. Raggi Named Chairman, Department of Avian Medicine.— Dr. Livio G. Raggi was appointed chairman of the University of California's Department of Avian Medicine on July 1, 1960.

Dr. Raggi, a native of Italy, received his D.V.M. degree from the University of Perugia, Italy, in 1944. He then worked for a year at the University of Padua, spent



Dr. Livio G. Raggi

the following year as a large animal practitioner in Padua, and then returned to the University of Perugia as an assistant professor in 1946. In 1948, he accepted a position as assistant director of the Experiment Station for the Prevention of Diseases of Animals in Teramo, where he remained until the following year, when he came to the University of California, Davis, as a graduate student in comparative pathology. Dr. Raggi was awarded his Ph.D., degree in 1955, and has been a member of the faculty of the Department of Avian Medicine since that time. He became an American citizen in November, 1958.

Dr. Raggi's first publication, "Experimental Inoculation of *Trichomonas fetus* into Rabbits," published in the Abstracts of the Italian Society of Experimental Biology, won the prize "Friggeri" in 1943. Since then, he has published numerous scientific papers. His main field of research is in viral diseases of poultry, notably infectious bronchitis, laryngotracheitis, and Newcastle disease.

DR. WALTER W. SADLER HEADS DEPARTMENT OF PUBLIC HEALTH.—Dr. Walter W. Sadler was appointed chairman of the Department of Public Health at the University of California on July 1, 1960.

He has been on the University of California faculty for the past ten years. Dr. Sadler took a brief sabbatical to earn his Master of Public Health degree from the University in 1958.

Dr. Sadler has held a number of inspection positions with the USDA, has maintained large and small animal veterinary practices, and has served as a research assistant studying the Cassius environment of avian embryos at Colorado State University.

Presently his research interests include an antemortem and postmortem study of poultry with emphasis on the factors influencing wholesomeness of the dressed carcass; the effect of metabolic rate upon pathogenesis of disease (in particular rabies and brucellosis); the epidemiology of occupational diseases of veterinarians; and the role of the bat and spotted skunk in the ecology of rabies virus in nature.

DR. O. W. SCHALM APPOINTED CHAIRMAN, DEPARTMENT OF CLINICAL PATHOLOGY.—Dr. O. W. Schalm was appointed chairman of the Department of Clinical Pathology, Univer-



Dr. O. W. Schalm

sity of California, on July 1, 1960. He had received both his M.S. and his Ph.D. degrees from the University of California.

Dr. Schalm's research program for graduate study had involved investigations in respiratory disease of poultry. Since 1937 his major research activity has been in the field of bovine mastitis. He was a Marshall Plan advisor to Denmark on mastitis control from February to May, 1952. Dr. Schalm was also a Fulbright Grantee for the 1959-60 academic year, to the Veterinary School, University of Munich. His special interest in the field of clinical pathology is veterinary hematology.

Colorado State University

Promotions for the 1960 to 1961 school year at Colorado State University went to Drs. J. R. Collier (OSU '41), head, Department of Pathology and Bacteriology; W. A. Aanes (COL '50), associate professor, Department of Clinics and Surgery; Maxine M. Benjamin (COL '48), professor, Department of Pathology and Bacteriology; H. E. Bredeck, professor, Department of Physiology; E. E. Flamboe, assistant professor, Department of Physiology; and James Voss, assistant professor, Department of Clinics and Surgery.

New appointments made at the school went to Drs. John M. Cheney, instructor, Department of Pathology and Bacteriology; Neal K. Clapp, instructor, Department of Clinics and Surgery; Donald R. Dietz, temporary junior chemist, Department of Pathology and Bacteriology; Edward L. Gillette (KSU '56), temporary instructor, Department of Medicine; Edwin B. Howard (COL '59), graduate fellow, Department of Pathology and Bacteriology; Theodore Kramer, temporary part-time junior pathologist, Department of Pathology and Bacteriology; Arthur C. Lee (COL '52), temporary junior radiologist, Department of Medicine; Clarence B. Lofton, temporary instructor in bacteriology, Department of Pathology and Bacteriology; William V. Lumb (KSU '43), associate professor, Department of Medicine; John L. Martin, associate professor of biochemistry, Department of Pathology and Bacteriology; Joe P. Morgan, instructor, Department of Medicine; and J. Eugene Schneider, instructor, Department of Clinics and Surgery.

DR. JOHN R. COLLIER NAMED HEAD, DEPARTMENT OF PATHOLOGY AND BACTERIOLOGY.—Dr. John R. Collier (OSU '41) was appointed head of Colorado State University's Department of Pathology and Bacteriology on July 1, 1960.

Dr. Collier entered the Armed Forces



Dr. John R. Collier

immediately after graduation from veterinary school in 1941. He was a staff member of the medical field services school. He left the Army in 1946 and began a large animal practice in Minnesota. Two years later, he entered Iowa State College where he was employed in the Iowa veterinary diagnostic laboratory and in the Department of Veterinary Hygiene. He received a M.S. degree from ISU in 1951 and a Ph.D. degree in 1955.

Dr. Collier has worked in teaching and research on animal disease at Colorado State University since his arrival in 1956.

Cornell University

Three new department heads have been named by the New York State Veterinary College at Cornell University during the past year. They are: Drs. Cyril L. Comar, professor of physical biology and head of the Department of Physical Biology; Robert E. Habel (OSU '41), professor of veterinary anatomy and head of the Department of

Anatomy; and Alvin F. Sellers (UP '39), professor of veterinary physiology and head of the Department of Veterinary Physiology.

Promotions awarded by the College went to Drs. Clyde I. Boyer, Jr. (UP '40), professor of poultry diseases: Leland E. Carmichael (CAL '56), acting professor of vetterinary bacteriology; Howard E. Evans, professor of veterinary anatomy and secretary of the College; Julius Fabricant (UP '42), professor of poultry diseases; Morely R. Kare, professor of veterinary physiology; John F. Kavanaugh (COR '54), assistant professor of veterinary surgery: John A. Lowe (COR '59), resident of the Department of Surgery; and Daniel W. Tapper, research associate, Department of Physical

Biology.

New faculty members at the New York State Veterinary College are: Drs. T. Lyn Barber (AUB '58), research specialist in the Department of Pathology and Bacteriology; Robert B. Barrett (COR '56), assistant professor of radiology; Albert M. Beck (COR '59), assistant professor of small animal medicine; Delwin L. Bokelman (KSU '58), instructor in veterinary pathology; Alexander de Lahunta (COR '58), instructor in veterinary anatomy; Lennart P. Krook, associate professor of veterinary pathology and bacteriology; David A. Morrow, medical interne, Department of Medicine; Neil L. Norcross, assistant professor of immunochemistry; Fritz R. Preuss, visiting professor of veterinary anatomy; George E. Ross, Jr., medical interne, Department of Small Animal Medicine and Surgery; Al. W. Stinson (GA '56), assistant professor of veterinary anatomy; John B. Tasker, Jr. (COR '57), instructor, Department of Pathology and Bacteriology; and Philip A. Weber, Jr., medical interne, Department of Small Animal Medicine and Surgery.

DR. C. L. COMAR BECOMES HEAD, DEPART-MENT OF PHYSICAL BIOLOGY.—Dr. C. L. Comar has been appointed head of the Department of Physical Biology and director of the Laboratory of Radiation Biology at Cornell University.

Dr. Comar was one of the pioneers in the use of radioisotopes in large animal research and for many years has been doing research on fission products in the food chain and related problems in bone metabolism. Prior to coming to Cornell to establish the Lab-



Dr. C. L. Comar

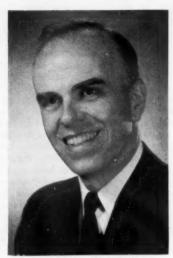
oratory of Radiation Biology, he was director of the University of Tennessee-Atomic Energy Commission Agricultural Research Program and chief of biomedical research at Oak Ridge Institute of Nuclear Studies.

Dr. Comar has served on many international committees and is a consultant to the United Nations Food and Agricultural Organization in regard to problems of food contamination.

DR. ROBERT E. HABEL NAMED NEW VETER-INARY ANATOMY HEAD AT CORNELL.-Dr. Robert E. Habel has been appointed head of the Department of Veterinary Anatomy at Cornell University. He has been a faculty member of the University since 1947 when he received his M.S. degree from the school.

In 1953 to 1954 Dr. Habel was granted a research fellowship by the National Institutes of Health, U.S.P.H.S., and spent the year in study at the Institute of Veterinary Anatomy, University of Utrecht. In 1956 he defended a doctoral thesis before the faculty of that university and was granted the M.V.D. degree.

Dr. Habel had continued research on the innervation of the ruminant stomach with a grant from the AVMA Research Fund. His research interests are in the anatomy and physiology of the bovine digestive system.



Dr. Robert E. Habel

He has published a textbook and laboratory guides in veterinary histology, bovine anatomy, and applied anatomy.

DR. A. F. SELLERS TO HEAD DEPARTMENT OF PHYSIOLOGY AT CORNELL.—Dr. Alvin F. Sellers (UP '39), was appointed Professor of Physiology and Head of the Department of Physiology in Cornell University's New York State Veterinary College effective



Dr. Alvin F. Sellers

Sept. 1, 1960. He succeeds Dr. H. H. Dukes (ISU '18), who retired recently.

Dr. Sellers, internationally known for his work in ruminant digestion and reproduction, and ion transport, was formerly with the University of Minnesota, where in the last 10 years he helped develop the Division of Veterinary Physiology and Pharmacology.

He received a Joshua B. Lippincott Award upon graduation from veterinary college and attended Ohio State University where he earned the M.Sc. degree. He then did graduate work in the fields of animal physiology and biochemistry while studying for a Ph.D. degree at the University of Minnesota. During this time he was also an instructor in physiology at the university.

In 1942 Dr. Sellers entered the Army where he performed analyses on field water supplies and study control of enteric diseases in the United States, Algeria, Italy, France, and Germany with the Fifth and Seventh Armies. He served as Chief of the Section on Bacteriology and commanded one of three mobile units of the parent First Medical Laboratory.

Dr. Sellers returned to the University of Minnesota in 1946 and later served as associate professor and professor and head of the Division of Veterinary Physiology and Pharmacology. He received his M.Sc. in 1949 after performing thesis work under a grant from the U.S. Public Health Service.

He was a research fellow under the John Simon Guggenheim Memorial Foundation at the Physiological Laboratory, University of Cambridge, England, and the Rowett Research Institute, Bucksburn, Scotland, from September, 1957, to March, 1958. He has written and co-authored a total of 41 technical reports based on his research.

Dr. Sellers is a past-president of the American Society of Veterinary Physiologists and Pharmacologists and a member of the AVMA, American Physiological Society, Conference of Research Workers in Animal Diseases, American Association for the Advancement of Science, American Society of Veterinary Physiologists and Pharmacologists, and Society for Experimental Biology and Medicine.

Georgia, University of

Additions to the faculty of the University of Georgia School of Veterinary Medicine include: Drs. Milton E. Adsit (COR '50), assistant professor of medicine and surgery; James E. Christy (OKL '54), assistant professor of medicine and surgery; Donald E. Davis (OSU '52), assistant professor of microbiology and preventive medicine; William T. Gerard (GA '58), assistant professor of microbiology and preventive medicine; Merle C. Loveless, instructor in medicine and surgery; H. C. Morgan, Jr. (AUB '55), assistant professor of pathology and parasitology; and Jack R. Whittaker, instructor in anatomy and histology.

Dr. E. A. Corley is acting head of the Small Animal Division of the Department of Medicine and Surgery at the University of Georgia while Dr. E. W. Causey, head, is on a two-year leave-of-absence to Cambodia.

Illinois, University of

The following additions were made to the staff of the College of Veterinary Medicine at the University of Illinois: Drs. Ferron L. Andersen, assistant, Department of Pathology and Hygiene; Richard D. Andrews, assistant, Department of Pathology and Hygiene; Robert L. Brewer (CAL '54), instructor, Department of Clinical Medicine; Michel G. Cote, instructor, Department of Physiology and Pharmacology; Frederick B. Hembrough (ILL '54), instructor, Department of Physiology and Pharmacology; William G. Huber (ILL '52), assistant professor, Department of Physiology and Pharmacology; Ernest T. Littledike, instructor, Department of Anatomy and Histology; Dennis K. Mann, instructor, Department of Pathology and Hygiene; Bronislaw Mendlowski (EDN '47), veterinary II, Diagnostic Laboratory, State Department of Agriculture; Renate Oppenlander, assistant, Department of Pathology and Hygiene; John O. Schaeffler, instructor, Department of Pathology and Hygiene: Joseph Simon (KSU '46), professor, Department of Pathology and Hygiene; Diego Segre (MIL '47), professor, Department of Pathology and Hygiene; and Amos P. Wilson (KSC '43), animal pathologist II, Diagnostic Laboratory, State Department of

Dr. Shyamal K. Sinha (PHI '50) was appointed associate professor of physiology

and pharmacology on Sept. 1, 1960, and assigned to the College of Veterinary Science and Animal Husbandry, Mhow M.P., India.

lowa State University

New appointments to the faculty of the College of Veterinary Medicine at Iowa State University are: Drs. Robert P. Beliles. M.S., instructor of pharmacology, Department of Physiology and Pharmacology; Harry T. Bosworth (ISU '60), instructor, Department of Medicine and Surgery; Tracy L. Clark (KSU '60), instructor, Department of Obstetrics and Radiology; Dianne Davison (GA '52), associate, Department of Pathology; Harold E. Dziuk (MIN '54), associate professor, Department of Physiology and Pharmacology; Thomas M. Ford (MSU '57), instructor, Department of Hygiene; Perry J. Gehring (MIN '60), instructor, Department of Physiology and Pharmacology; William A. Hagan (KSU '15), professor; Department of Hygiene; Lea R. Hutchinson (UP '57), instructor, Department of Obstetrics and Radiology; Hillman A. Nelson (ISU '58), associate, Department of Medicine and Surgery; Dean I. Newton (KSU '50), assistant professor, Department of Physiology and Pharmacology; Waldemar K. Pilarski (University of Warsaw '51), instructor, Department of Anatomy; Lembit I. Saar (Ludwig-Maxmilian University '55). instructor, Department of Anatomy; David E. Tyler (ISU '57), assistant professor, Department of Pathology; and Martin Van Der Maaten (ISU '56), associate, Department of Hygiene.

Promotions at Iowa State University, effective July 1, 1960, went to Drs. Fred C. Davison (GA '52), assistant professor, Department of Physiology and Pharmacology; and Phillip T. Pearson (ISU '56), assistant professor, Department of Medicine and Surgery.

Kansas State University

New faculty members at Kansas State University are: Drs. Richard A. Arnold (KSU '58), instructor, Department of Anatomy; John M. Bowen (GA '57), assistant professor, Department of Physiology; Albert L. Burroughs (TEX '58), associate professor, Department of Pathology; James Gandy

(TEX '51), instructor, Department of Surgery and Medicine; S. L. Issar, B.V.Sc., M.S., graduate research assistant, Department of Pathology; Roy J. Milleret (KSC '44), instructor, Department of Pathology; Gaddi S. Murti, B.V.Sc., M.S., graduate research assistant, Department of Pathology; John L. Noordsy (KSU '46), instructor, Department of Surgery and Medicine; Bhagirath R. B. Persaud, D.V.M., M.S., research assistant, Department of Pathology; Orlen E. Pfeifer, D.V.M., instructor, Department of Surgery and Medicine; Robert N. Swanson, D.V.M., M.S., instructor, Department of Physiology; Wallace B. Wren (KSU '58), instructor, Department of Pathology.

Dr. Brian C. Cummings (KSU '57) was promoted from instructor to assistant professor in the College's Department of Anat-

omy.

Michigan State University

During the past year promotions have been given to the following faculty members at Michigan State University; Drs. Jack J. Stockton (OSU '43), head, Department of Microbiology and Public Health; Clifford C. Beck (MSU '54), assistant professor, Department of Surgery and Medicine; Gabel H. Conner (WSU '41), professor, Department of Surgery and Medicine; David J. Ellis (MSU '43), assistant professor, Department of Surgery and Medicine; Thomas W. Jenkins, Ph.D., associate professor, Department of Anatomy; and James A. Williams (MSU '50), assistant professor, Department of Veterinary Pathology.

New faculty members at Michigan State University are: Drs. Roger E. Brown (MSU '50), instructor, Department of Anatomy; Robert M. Diener, D.V.M., instructor, Department of Surgery and Medicine; Charles C. Middleton (MO '58), instructor, Department of Physiology; and Donald W. Twohy, Sc.D., instructor, Department of Microbiolo-

gy and Public Health.

DR. J. J. STOCKTON NEW HEAD OF DEPARTMENT OF MICROBIOLOGY AND PUBLIC HEALTH AT MSU.—Dr. Jack J. Stockton, East Lansing, was appointed head of Michigan State University's Department of Microbiology and Public Health on Jan. 1, 1960.

A native of Saint Paris, Ohio, Dr. Stock-

ton obtained his D.V.M. degree from Ohio State University in 1943. In 1944, he was commissioned a first lieutenant in the Veterinary Corps, U.S. Army, and served until June, 1947, with the rank of captain.



Dr. Jack J. Stockton

Dr. Stockton joined the faculty of the Department of Microbiology and Public Health at Michigan State University as an instructor on July 1, 1947. He was promoted to assistant professor in July, 1950, and to associate professor in July, 1959. During these years, he taught pathogenic bacteriology, immunology, instrumentation, and parasitology. His primary research activities have been bovine vibriosis and trichomoniasis, canine filariasis, and freeze drying.

In 1950, Dr. Stockton received his M.S. degree in bacteriology from Michigan State. He is co-author of a laboratory manual for pathogenic bacteriology and a manual for immunology. From 1953 to 1959, he was secretary-treasurer of the National Society of Phi Zeta. Dr. Stockton is currently completing requirements for his Ph.D. degree in epidemiologic science from the School of Public Health at the University of Michigan, Ann Arbor.

Minnesota, University of

Faculty members at the University of Minnesota College of Veterinary Medicine who received promotions during the past year are: Drs. C. M. Stowe (UP '50) pro-

fessor and head, Division of Veterinary Physiology and Pharmacology; Raymond C. Callstrom (MIN '59), instructor, Division of Veterinary Anatomy; Robert H. Dunlop (ONT '56), instructor, Division of Veterinary Physiology and Pharmacology; Alan J. Kenyon (MIN '57), research fellow, Division of Veterinary Bacteriology and Public Health; Ralph L. Kitchell (ISU '43), assistant dean; Albert C. Strafuss (KSU '54), instructor, Division of veterinary pathology and parasitology; John P. Sullivan (COL '53), assistant professor, Division of Veterinary Physiology and Pharmacology; and Edward A. Usenik (MIN '52), associate professor, Division of Veterinary Surgery

and Radiology. New faculty members at the University of Minnesota College of Veterinary Medicine are: Drs. William F. Brown, instructor, Division of Medicine and Clinics; Raymond C. Callstrom (MIN '59), instructor, Division of Anatomy; Stanley M. Dennis, instructor, Division of Pathology and Parasitology; Benjamin L. Hart, nonservice fellow, Division of Anatomy; Kenneth H. Johnson, nonservice fellow, Division of Pathology and Parasitology; LaRue W. Johnson, research fellow, Division of Medicine and Clinics; John K. King, research fellow, Division of Medicine and Clinics; Harold J. Kurtz, instructor, Division of Surgery and Radiology; Kenneth G. Magnuson, instructor, Division of Obstetrics; Harley W. Moon, instructor, Diagnostics Laboratory; William E. Moore (COR '58), instructor, Division of Medicine and Clinics; Ned E. Olson, research fellow, Division of Medicine and Clinics; Clarence A. Tervola (MIN '55), research fellow, Division of Bacteriology and Public Health; Shannon C. Whipp (MIN '59), research fellow, Division of Physiology and Pharmacology.

DR. C. M. STOWE APPOINTED HEAD, DIVISION OF VETERINARY PHYSIOLOGY AND PHARMACOLOGY AT MINNESOTA.—Dr. C. M. Stowe has been appointed head of the Division of Veterinary Physiology and Pharmacology at the University of Minnesota. Since 1958 Dr. Stowe had been assistant dean of the College of Veterinary Medicine there.

He had joined the faculty at the University in 1950 as an instructor in veterinary pharmacology. In 1955 he was awarded his Ph.D. degree in pharmacology.



Dr. C. M. Stowe

After graduation from Queens College, New York, in 1946, Dr. Stowe entered the U.S. Air Force. He remained in the Air Force for three-and-one-half years and had a tour of duty that took him to India and China. Upon his return he entered the veterinary college at the University of Pennsylvania and received his V.M.D. degree in 1950.

Dr. Stowe's special research interests have been in the studies of sulfonamide pharmacology in cattle, muscle relaxants and general anesthetics in large animals and cardiac output and cardiovascular function in large animals.

Missouri, University of

Two new department chairmen have been named at the School of Veterinary Medicine, University of Missouri, during the past year. They are: Drs. H. E. Dale (ISU '44), chairman, Department of Veterinary Physiology and Pharmacology; and Robert C. McClure (ISU '55), chairman, Department of Veterinary Anatomy.

New faculty members at the University are Drs. James H. Moser (MSU '44), assistant professor, Department of Veterinary Medicine and Surgery, and supervisor of animal care, School of Medicine; and Louis G. Tritschler (MU '60), instructor, Department of Veterinary Medicine and Surgery.

DR. H. E. DALE APPOINTED PROFESSOR AND CHAIRMAN OF THE DEPARTMENT OF VETERINARY PHYSIOLOGY AND PHARMACOLOGY AT MISSOURI.

—A 1944 graduate of Iowa State University,



Dr. Homer E. Dale

Dr. Homer E. Dale, newly appointed chairman of the Department of Veterinary Physiology and Pharmacology at the University of Missouri, has also received an M.S. degree from ISU in 1949 and a Ph.D. degree from the University of Missouri in 1953.

Dr. Dale has been a member of the University of Missouri faculty since 1951. His previous experience has been as a graduate assistant at Iowa State University (1947-1949), an assistant professor at the A. and M. College of Texas (1949-1950), and an instructor at the University of Wisconsin (1950-1951).

DR. ROBERT C. McClure Named Professor and Chairman of the Department of Veterinary Anatomy at Missouri.—Dr. Robert C. McClure has been appointed professor and chairman of the Department of Veterinary Anatomy at the University of Missouri.

Following receipt of his D.V.M. degree from ISU in 1955, Dr. McClure continued his graduate work and served as instructor in veterinary anatomy at Iowa from 1955 to 1956. He then was appointed an instructor in veterinary anatomy at Cornell University



Dr. Robert C. McClure

and worked there toward his Ph.D. degree in veterinary anatomy.

Dr. McClure's primary research interest is in the area of neuroanatomy and related structures, particularly the cranial nerves and their visceral components.

Oklahoma State University

Only one new faculty member was appointed to the College of Veterinary Medicine at Oklahoma State University during the past year. He is Dr. Sidney A. Ewing (GA '58), instructor, Department of Veterinary Parasitology.

Promotions at the University went to: Drs. Ralph G. Buckner (KSU '56), assistant professor, Department of Veterinary Medicine and Surgery; J. D. Friend (KSU '45), associate professor, Department of Veterinary Anatomy; Roger J. Panciera (OKL '53), associate professor, Department of Veterinary Pathology; and John H. Venable (OKL '53), associate professor, Department of Veterinary Anatomy.

Montreal, University of

The School of Veterinary Medicine, St. Hyacinthe, Que., has appointed a new dean

and one new department head during the past year. They are: Drs. Joseph Dufresne (COR '36), dean; and L. A. Gendreau (ONT '31), head of clinics.

Other appointments made during the year were: Drs. Leo G. Mathieu (MON '56), professor, nutrition and biochemistry; and Jacques Nantel (MON '49), professor, hy-

giene and food hygiene.

The Council of the School has been reorganized. It now is made up of Drs. Joseph Dufresne, dean; Ephrem Jacques (MON '42), assistant dean and director of extension; Lucien Cournoyer (MON '48), dean of studies; Jacques Saint-Georges (MON '40), secretary-registrar; Joseph Nadeau (MON '40), bursar; L. A. Gendreau (ONT '31), head of clinics; and L. P. Phaneuf (MON '51), head of research.

DR. JOSEPH DUFRESNE APPOINTED DEAN, SCHOOL OF VETERINARY MEDICINE, PROVINCE OF QUEBEC (See J.A.V.M.A., 137, (Dec. 1, 1960): 677).

Dr. L. A. Gendreau Named Head of Clinics at St. Hyacinth.— Dr. L. A. Gendreau (ONT '31) was appointed head of clinics at the School of Veterinary Medicine, Province of Quebec. He had maintained a general practice in Sherbrook, Quebec, for nearly 30 years. He is well known as a surgeon, speaker, and horse show judge.

Ohio State University

Three department chairmen have been given additional responsibilities at the Ohio State University College of Veterinary Medicine. They are: Drs. Clarence R. Cole (OSU '43), assistant dean, research development, and chairman of the Department of Veterinary Pathology; John H. Helwig (OSU '37), director of continuing education of the College and chairman, Department of Veterinary Preventive Medicine; and Walter G. Venzke (ISU '35), assisant dean and secreary of the College and chairman, Department of Veterinary Anatomy.

Promotions during the past year were given to: Drs. Robert L. Farrell (OSU '50), professor, Department of Veterinary Pa-

thology; Albert A. Gabel (OSU '54), assistant professor, Department of Veterinary Surgery; Harold F. Groves (OSU '51), associate professor, Department of Veterinary Parasitology; Nelson B. King (OSU '48), associate professor, Department of Veterinary Research; Thomas E. Powers, assistant professor, Department of Veterinary Physiology and Pharmacology; and George P. Wilson (UP '55), assistant professor, Department of Veterinary Surgery.

New faculty members of the College are: Drs. Donald Baldwin (KSU '58), instructor, Department of Bacteriology; Charles C. Capen, research assistant, Department of Veterinary Pathology; Harrison M. Gardner (OSU '56), instructor, Department of Veterinary Medicine; John P. Gibson (KSU '59), research assistant, Department of Veterinary Pathology; Robert D. Henthorne (OSU '43), part-time professor, Department of Veterinary Medicine; and Aaron Horowitz (OSU '59), instructor, Department of Veterinary Anatomy.

DR. CLARENCE R. COLE NAMED PART-TIME ASSISTANT DEAN, RESEARCH DEVELOPMENT, AT OHIO STATE.—DR. Clarence R. Cole (OSU '43), professor and chairman of the Department of Veterinary Pathology at Ohio State University, was also named part-time assist-



Dr. Clarence R. Cole

ant dean, research development, in the College of Veterinary Medicine.

Dr. Cole has earned his M.S. and Ph.D. degrees at Ohio State. He joined the university faculty in 1943 as an assistant in the Department of Veterinary Pathology; he was made an instructor in 1944, an assistant professor in 1947, and an associate professor in 1948. He served as an associate professor until 1950, when he was appointed to his present position.

In addition to his duties in his college, Dr. Cole has served since 1946 as a part-time professor in the College of Medicine, teaching and taking part in joint research projects.

Dr. Cole is the author of 60 articles which have appeared in professional journals and has contributed chapters to two books. He is active in many national and international professional organizations and projects.

DR. JOHN H. HELWIG NAMED DIRECTOR OF CONTINUING EDUCATION AT OHIO STATE.—Dr. John H. Helwig (OSU '37), professor and chairman of the Department of Veterinary Preventive Medicine at Ohio State University, was given the additional post of director of continuing education in the College. Dr. Helwig received his M.S. degree from OSU in 1939.

At Ohio State, he served as an instructor until 1944, as an assistant professor until



Dr. John H. Helwig

1946, and as an associate professor until 1951, when he was advanced to his present rank. He has served as chairman of the department since 1946.

DR. WALTER G. VENZKE APPOINTED ASSISTANT DEAN AND SECRETARY, COLLEGE OF VETERINARY MEDICINE, OSU.—Dr. Walter G. Venzke (ISU '35), professor and chairman of the Department of Veterinary Anatomy at Ohio State University, also has served as part-time assistant dean and secretary



Dr. Walter G. Venzke

of the College of Veterinary Medicine since October, 1960. Dr. Venzke has been a member of the university faculty since 1946.

He received his M.S. degree in genetics from the University of Wisconsin in 1937, and his Ph.D. degree in anatomy from Iowa State in 1942.

From 1942-46, Dr. Venzke served with the U.S. Army Veterinary Corps, attaining the rank of lieutenant colonel.

At Ohio State, he served as a temporary instructor in the Department of Zoology in 1946 before being appointed assistant professor in the Department of Veterinary Preventive Medicine, where he served until 1948. In 1948, he was made associate professor and chairman of the Department of Veterinary Medicine. He was elevated to his present position in 1954.

Dr. Venzke is the author of approximately 35 articles which have appeared in various professional journals.

Pennsylvania, University of

Promotions at the University of Pennsylvania School of Veterinary Medicine during the past year were given to: Drs. Laurence S. Cushing (UP '57), associate in veterinary medicine, Department of Applied Veterinary Medical Sciences; James E. Prier (COR '46), associate professor of virology, Department of Veterinary Biology; Robert M. Sauer (UP '52), V.M.D., assistant professor of veterinary pathology, Department of Veterinary Biology; Ernest J. Witte (UP '42), V.M.D., visiting assistant professor of veterinary hygiene; Department of Veterinary Biology; and Jacques Jenny, D.V.M. (Zurich), professor of orthopedic surgery. Department of Applied Veterinary Medical Sciences.

Dr. Evan L. Stubbs (UP '11), emeritus professor of veterinary pathology, Department of Veterinary Biology, retired from the

faculty in the past year.

Additions to the University of Pennsylvania School of Veterinary Medicine faculty are: Drs. George Bjotvedt (UP '58), instructor in laboratory animal medicine; Department of Applied Veterinary Medical Sciences; James W. Buchanan, D.V.M., instructor in medicine; Department of Applied Veterinary Medical Sciences; Lawrence G. Clark (ILL '57), instructor in veterinary medicine, Department of Applied Veterinary Medical Sciences; Daniel D. Cohen (ILL '55), research assistant professor of veterinary public health, Department of Applied Veterinary Medical Science; Stephen P. Dey, D.V.M., instructor in veterinary surgery, Department of Applied Veterinary Medical Sciences; Ray M. Dutcher, Ph.D., research assistant professor of virology, Department of Applied Veterinary Medical Sciences; Gary L. Enold (OSU '59), instructor in surgery, Department of Applied Veterinary Medical Sciences; Maryln R. Ernst, V.M.D., instructor in veterinary surgery, Department of Applied Veterinary Medical Sciences; Harry C. Fegley (UP '54), associate in pathology, Department of Veterinary Biology; Elaine P. Hammel, V.M.D., instructor in veterinary medicine, Department of Applied Veterinary Medical Sciences; David S. Kronfeld, D.V.M., Ph.D., assistant professor of pharmacology, Department of Animal Biology; William C. Lawrence (UP '59), instructor in virology, Department of Applied Veterinary Medical Sciences: Charles N. Leezy, D.V.M., instructor in veterinary medicine, Department of Applied Veterinary Medical Sciences; Willem D. Malherbe, B.V.Sc., visiting professor of clinical laboratory medicine, Department of Applied Veterinary Medical Sciences; Robert R. Pensinger, D.V.M., instructor in physiology, Department of Animal Biology; Virginia D. Perryman, D.V.M., instructor in veterinary medicine, Department of Applied Veterinary Medical Sciences: Donald H. Pitkin, M.S., research instructor in veterinary medicine. Department of Applied Veterinary Sciences: Alphonsus R. Romeika, L.L.B., instructor in veterinary jurisprudence, Department of Applied Veterinary Medical Sciences: Himansu C. Sen, Ph.D., associate in parasitology, Department of Veterinary Biology; Prafulchandra C. Shah, Ph.D., research assistant professor of biochemistry assigned to medicine, Department of Applied Veterinary Medical Sciences; and Alfred M. Wallbank, Ph.D., research assistant professor of microbiology, Department of Veterinary Biology.

Purdue University

Following is a list of new appointments at the School of Veterinary Science and Medicine, Purdue University: Drs. Erskine V. Morse (COR '44), dean, School of Veterinary Science and Medicine; J. R. Annis (COL '50), associate professor, Department of Clinics; W. W. Carlton (AUB '50), instructor, Department of Microbiology, Pathology and Public Health: W. L. Downey (UP '49), head, Brucellosis Testing Service; J. F. Fessler (OSU '60), instructor, Department of Clinics; R. C. Herschler (MIN '56), assistant professor, Department of Clinics; A. M. Lavignette (COR '58), assistant professor, Department of Clinics: R. L. Morter (ISU '57), associate professor, Department of Veterinary Science; L. D. Olson (MIN '58), instructor, Department of Microbiology, Pathology, and Public Health: O. F. Roesel (OSU '60), instructor, Department of Physiology and Pharmacology; and M. W. Stromberg (MIN '53), associate professor, Department of Anatomy.

DR. ERSKINE V. MORSE APPOINTED DEAN, SCHOOL OF VETERINARY SCIENCE AND MEDICINE, PURDUE.— Dr. Erskine V. Morse (COR '44), 38, was appointed dean of the School of Veterinary Science and Medicine, Purdue University, January 20, 1960.

Dr. Morse studied agriculture at the University of California, Davis, in 1939-40. He then enrolled at Cornell University and



Dr. Erskine V. Morse

received his D.V.M. degree in 1944, his M. S. degree in 1948, and his Ph.D. degree in 1949. His graduate work was completed through a grant from the AVMA Research Fund. From 1944 to 1947 Dr. Morse served in the Army Veterinary Corps.

Dr. Morse was at the University of Wisconsin as assistant professor and later as associate professor of veterinary science from 1949 to 1955. He then spent three years on the faculty of Michigan State University where he was associate professor and then professor of microbiology and public health. He left a position as associate director of the Veterinary Medical Research Institute at Ames, Iowa, which he had held since July, 1958, to accept his appointment as dean at Purdue.

Dr. Morse is the author of more than 75 articles, bulletins, and reports on veterinary science and animal health.

Texas, A. & M. College of

During the past year, the following faculty members of the Agricultural and Mechanical College of Texas received promotions: Drs. Charles H. Bridges (TEX '45), professor and head, Department of Veterinary Pathology; Bernard M. Cooley (TEX '48), assistant professor, Department of Veterinary Medicine and Surgery; Thomas J. Galvin (TEX '57), assistant professor, Department of Veterinary Parasitology; Paul F. Jungerman (TEX '47), associate professor, Department of Veterinary Microbiology; James D. McCrady (TEX '58), assistant professor, Department of Veterinary Physiology and Pharmacology; and William M. Romane (TEX '44), associate professor, Department of Veterinary Medicine and Surgery.

New appointments to the faculty of the College are: Drs. Lamar H. Carrol (TEX '58), instructor, Department of Veterinary Microbiology; Ralph G. Greeley (MO '53), instructor, Department of Veterinary Anatomy; Chester F. Meinecke (KAN '52), instructor, Department of Veterinary Microbiology; Walter F. Mestanza (Peru '51), assistant professor, Department of Veterinary Pathology; Robert S. Titus (OKL '59), instructor, Department of Veterinary Medicine and Surgery; and Mark F. Young (ISU '58), instructor, Department of Veterinary Medicine and Surgery.

DR. CHARLES H. BRIDGES NAMED HEAD, DE-PARTMENT OF VETERINARY PATHOLOGY.—Dr. Charles H. Bridges has been named head of the Department of Veterinary Pathology



Dr. Charles H. Bridges

in the School of Veterinary Medicine at A. & M. College of Texas, Dr. Bridges holds M.S. and Ph.D. degrees and is a member of the American College of Veterinary Pathologists.

After four years in private practice, Dr. Bridges joined the faculty of Louisiana State University for two years as a research associate and instructor. He then entered the U.S. Air Force Veterinary Corps for four years. After leaving active military service, Dr. Bridges was made a fellow in pathology at the Armed Forces Institute of Pathology. He joined the faculty of the A. & M. College of Texas School of Veterinary Medicine as an associate professor in 1955 and was promoted to full professor in 1959.

Dr. Bridges is the author of many scientific and technical reports. He is currently doing research on the nature, cause, and diagnosis of hip dysplasia. He is also interested in the zoonoses.

Toronto, University of

One promotion was given to a faculty member at the Ontario Veterinary College (affiliated with the University of Toronto) during the past year. It went to Dr. W. J. B. Ditchfield (ONT '56), D.V.M., assistant pro-

fessor, Extension Program.

New faculty members at the College are: Drs. J. E. Alexander, D.V.M., assistant professor, Department of Medicine and Surgery; T. J. L. Alexander, B.V.Sc. (London), M.V.Sc., M.R.C.V.S., assistant professor, Department of Medicine and Surgery; H. Herchen (Giessen), assistant professor, Department of Anatomy; A. McCarter, B.A., laboratory scientist, Department of Physiological Sciences; P. W. Pennock, D.V.M., assistant professor, Department of Medicine and Surgery; D. C. Pope (London), M.R.C.V.S., assistant professor, Department of Medicine and Surgery; and O. M. Radostits, D.V.M., assistant professor, Department of Medicine and Surgery.

Tuskegee Institute

One promotion was given by Tuskegee Institute during the past year. It was given to Dr. Edward T. Braye (TUS '52), assistant professor and acting head, Department of

Large Animal Medicine, Surgery and

Additions to the Institute faculty are: Drs. Jerry A. Clinkscales, D.V.M., instructor, Department of Small Animal Medicine, Surgery and Clinics; Laval N. Cothran (TUS '57), instructor, Department of Physiology and Pharmacology; Edward Jones, D.V.M., instructor, Department of Small Animal Medicine, Surgery and Clinics; Augustine N. Njoku-Obi, Ph.D., assistant professor, Department of Bacteriology and Public Health; Booker T. Outland, D.V.M., instructor, Department of Large Animal Medicine, Surgery and Clinics; and James Strickland (API '52), assistant professor, Department of Anatomy and Histology.

Washington State University

Promotions during the past year at Washington State University went to: Dr. Robert L. Leader (WSU '52), associate professor, Department of Veterinary Pathology; and Robert P. Worthman (KSU '43), associate professor, Department of Veterinary Anatomy.

New faculty members at the College of Veterinary Medicine, Washington State University, are: Drs. Richard R. Chalquest (WSU '57), assistant professor and assistant veterinarian, Department of Veterinary Microbiology; Jerry A. Harsch (WSU '55), instructor, Department of Clinical Medicine and Surgery; John M. King (WSU '30), assistant professor, Department of Veterinary Pathology; Donald R. Lingard (ONT '55), instructor, Department of Veterinary Clinical Medicine and Surgery; and George H. Stabenfeldt (WSU '56), junior veterinarian, Department of Veterinary Pathology.

American Association of Veterinary Anatomists Meets

Problems associated with the revision of veterinary anatomical nomenclature were the main points of discussion at the 12th annual meeting of the American Association of Veterinary Anatomists in Denver, Colo., last August.

The Association's Nomenclature Committee is currently working with the International Commission for Veterinary Anatomical Nomenclature to establish an internationally approved nomenclature.

Officers elected at the meeting are: Drs. T. C. Fitzgerald (OSU '28), Auburn, Ala., president; R. Getty (OSU '40), Ames, Iowa, president-elect; and George C. Christensen (COR '49), Lafayette, Ind., secretary-treasurer.

Conference of Public Health Veterinarians Meets

The annual scientific and business sessions of the Conference of Public Health Veterinarians were held in conjunction with the meeting of the American Public Health Association in San Francisco, Oct. 31 to Nov. 4, 1960.

A highlight of the meeting was the presentation of a "Resolution of Appreciation" to Dr. Henry A. Holle, medical director, U.S. Public Health Service, for "outstanding contributions to, and support of, the development and improvement of veterinary public health activities throughout the United States." The resolution particularly noted Dr. Holle's leadership in developing a Division of Veterinary Medicine in the Texas State Department of Health while he was Texas Commissioner of Health, his personal interest and effective actions in support of the Veterinary Corps of the U.S. Army when it was suggested that the Corps be abolished,



Dr. Henry A. Holle (left) receives a "Resolution of Appreciation" from Dr. R. K. Anderson, past-president of the Conference of Public Health Verlinarians, in recognition of his efforts supporting progress in the field of veterinary public health.

and his outstanding role in exploring and publicizing the public health need for official inspection of poultry for wholesomeness.

At the scientific sessions of the Conference, papers were given on rabies, streptococcic infections, respiratory and enteric virus infections, simian malaria, brucellosis, nocardiosis, histoplasmosis, and canine lymphoma.

Conference officers for the coming year are: Col. Mervyn B. Starnes (TEX '27), Washington, D.C., president; Col. Robert L. Hummer (UP '34), New York, N.Y., secretary-treasurer; and Dr. Joe W. Atkinson (KSU '50), Arlington, Va., president-elect.

Revised Council Report—AVMA Council on Public Health and Regulatory Veterinary Medicine

Urge African Horse-Sickness Control; Elect New Officers.—On the recommendation of its Disease Review Committee, the Council on Public Health and Regulatory Veterinary Medicine at its fifth meeting at the AVMA Headquarters in Chicago, Nov. 14-15, 1960, urged that the ARS, FAO, and U.S. Department of Defense lend all possible technical assistance to control and contain the rapid spread of African horse-sickness and to take necessary steps to make available effective vaccines.

Among the actions taken by the Council at this meeting was introduction of a motion directing a subcommittee of the Council to prepare a report regarding the position that the AVMA should take on food additives and chemicals in agriculture.

A special survey committee of the Council reported on a project to obtain an estimate of the number of veterinarians needed now and in the future in the fields of public health and regulatory veterinary medicine, determining also adequacy of salaries. Council members associated with the Communicable Disease Center and the USDA were requested to consult with the statistical data sections of their respective agencies in the hope that information could be obtained to assist in preparation of the survey. It was planned that the special survey project should be discussed with the Council on Education.

A project of the Food Hygiene Committee to prepare four booklets for distribution to individuals or organizations interested in setting up a non-federal meat inspection program was discussed and an analysis made of the preliminary form of the booklets. The problem of financing publication of the booklets, after final revisions have been made, was not solved.

Elected at the meeting were R. K. Anderson, St. Paul, Minn., chairman; C. L. Campbell, Tallahassee, Fla., vice-chairman; and Russell McNellis, Washington, D.C., secretary.

American Veterinarians Serve on WHO Rabies Committee

Two American veterinarians are serving on the World Health Organization's Expert Committee on Rabies which recently completed its fourth report.

They are Drs. M. M. Kaplan, chief, Veterinary Public Health, Division of Communicable Diseases, WHO, Geneva, Switzerland; and E. S. Tierkel, chief, Rabies Control Unit, Communicable Disease Center, U.S. Public Health Service, Atlanta, Ga.

The fourth report, recently completed by the international committee, is a careful reappraisal and modification of recommendations made in previous reports. It was needed because of new knowledge acquired in recent years. These recent advances are summarized in this report by the Committee as follows:

Vaccines.—An inactivated virus vaccine which is prepared from infected duck embryo and which is almost free of the factor responsible for postvaccination allergic encephalitis has been developed. It has been demonstrated that phenolized as well as irradiated vaccine may be freeze-dried with preservation of its antigenicity and increased

stability on storage. A new batch of international reference vaccine has been made available.

Anti-Rabies Serum.—Methods of production and concentration of antibodies have been improved. An international standard serum has been established.

Diagnosis.—A highly specific, rapid method of diagnosis has become available which employs the fluorescent antibody technique.

Prevention of Rabies in Man.—Additional field experience has confirmed the fact that combined serum and vaccine treatment gives the best results in postexposure treatment. Amended schedules of postexposure treatment have been developed to reduce the interference between serum and vaccine in the combined treatment. The demonstration of efficiency of the antibody response to booster doses of vaccine has led to the development of a recommended procedure for pre-exposure immunization in special population groups.

Pathogenesis.—Studies of susceptibility and salivary gland tropism of rabies virus in certain wild vectors has helped explain some aspects of the ecology of the disease.

Tissue Culture of Virus.—Preliminary results of growth of rabies virus in several tissue culture systems offer promising possibilities for future use of this technique in basic quantitative studies of the virus, in diagnosis, and even as a possible source of virus for vaccine production.

Results of WHO Questionnaire.—More clear-cut information concerning the present world situation in rabies is now available and there is evidence of progress in the application of modern methods.

The report is available in English, French,

The WHO Expert Committee on Rabies is shown during their work on the recently completed Fourth Report. The doctors shown in the picture are: Seated left to right—K. Habel, Bethesda, Md.; H. Koprowski, Philadelphila, Pa.; N. Veeraraghavan, Coonoor, India; M. M. Kaplan,



Geneva, Switzerland; E. S. Tierkel, Atlanta, Ga. Standing left to right—O. Ryberg, Alnarp, Sweden; R. Schindler, Hamburg, Germany; M. Abdussalam, Geneva, Switzerland; M. Selimov, Moscow, USSR; A. Kemron, Tel-Aviv, Israel; P. Lepine, Paris, France; and G. Bijlenga, Geneva, Switzerland.

and Spanish. It is 28 pages long and can be obtained for 30 cents. Ask for the Expert Committee on Rabies, Fourth Report, World Health Organization Technical Report, Series No. 201, Columbia University Press, 2960 Broadway, New York 27, N.Y.

Dr. A. O. Foster Named Director, USDA Beltsville Parasite Laboratories

The appointment of Dr. Aurel O. Foster as director of USDA's parasite research laboratories at Beltsville, Md., was announced Oct. 12, 1960, by the USDA.

Since 1941, Dr. Foster has been in charge of ARS research on means of controlling animal parasites. He has been recognized as an outstanding veterinary parasitologist for more than 20 years. In his new position, Dr. Foster will direct and coordinate USDA research programs in all phases of animal parasitology at the Beltsville Laboratories.



Dr. Aurel O. Foster

Dr. Foster has B.A. and M.A. degrees from Wesleyan University, Middletown, Conn., and his Sc.D. degree from Johns Hopkins University, Baltimore, Md. He began his career as a USDA parasitologist in 1939, after five years of research at the Gorgas Memorial Laboratory, Panama City, Panama.

Dr. Foster is a member and a past-presi-

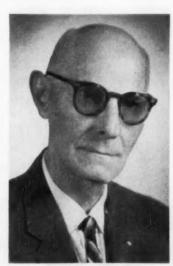
dent of the American Society of Parasitologists. He is also a member and fellow of the American Association for the Advancement of Science, the American Society of Tropical Medicine, the American Microscopical Society, the Helminthological Society of Washington, and a former fellow of the Royal Society of Tropical Medicine and Hygiene. He is an elected member-at-large of the Board of the Washington Academy of Sciences.

Dr. Foster is author of more than 150 scientific papers and publications.

Dr. E. D. Leiby Retires after 36 Years with USDA

Dr. Edward D. Leiby (COL '20), veterinarian in charge, Harrisburg, Pa., Animal Disease Eradication Division, ARS, retired from federal service Aug. 31, 1960. He had served the USDA for 36 years.

For 4 years immediately following graduation from veterinary school, Dr. Leiby worked as a general practitioner. Then, in 1924, he entered the Meat Inspection Service of the former Bureau of Animal In-



Dr. Edward D. Leiby

dustry in St. Joseph, Mo. He was transferred to Utah in 1925 and, in 1947, he was appointed assistant veterinarian in charge at Cheyenne, Wyo. He was transferred in the same capacity to Harrisburg, Pa., in 1951 and promoted to veterinarian in charge of the Pennsylvania station in 1954.

During the course of his career, Dr. Leiby received special training in the diagnosis of vesicular diseases. He participated in vesicular stomatitis inspections in Utah and Wyoming. He also conducted vesicular exanthema investigations in Pennsylvania, Maryland, Connecticut, New Jersey, Massachusetts, New York, and Rhode Island. In 1959, he was the recipient of a USDA Incentive Award for outstanding service.

Dr. Leiby is a member of the AVMA and the Pennsylvania Veterinary Medical Association.

Dr. R. W. Boone Transferred to Pennsylvania

Dr. Ralph W. Boone (KSU '24) was appointed veterinarian in change, Harrisburg, Pa., Animal Disease Eradication Division, ARS, effective Sept. 11, 1960. He was veterinarian in charge at Jefferson City, Mo., from January, 1958, to September, 1960.



Dr. Ralph W. Boone

After 13 years in private practice, Dr. Boone entered federal service in Illinois in 1937. For the next 10 years his activities were devoted to brucellosis eradication. He was then transferred to animal inspection

and quarantine functions in New York state, where he remained for 4 years. On June 24, 1951 he was appointed assistant veterinarian in charge of Michigan. He served in this capacity for 4 years and then as acting veterinarian in charge for 1 year. On Jan. 26, 1958, he was appointed veterinarian in charge in Jefferson City, Mo.

Dr. Boone is a member of the AVMA and the Missouri Veterinary Medical Association, the National Association of Federal Veterinarians, and the United States Livestock Sanitary Association.

Among the States and Provinces

Idaho



Idaho was awarded its certificate for attaining a modified-certified Brucellosis status on Oct. 31, 1960 at the 47th annual convention of the Idaho Cattlemen's Association. At the presentation of the award were (left to right) G. C. Anderson, secretary of the Idaho Dairymen's Association, and Amos Sckert, president; Dr. C. K. Mingle, USDA, Washington, D. C.; and Stanley I. Trenhaile, Idaho commissioner of agriculture. Mr. Trenhaile received the cward on behalf of Governor Robert E. Smylie.

Pennsylvania

PENNSYLVANIA V.M.A. RETAINS PUBLIC RE-LATIONS COUNSEL.—The Pennsylvania V.M.A. has retained the service of Ray Thompson & Associates, Inc., to develop and conduct a state-wide public relations program.

The agency, with home offices in Baltimore, Md., has represented the Maryland State V.M.A. for the past year and one-half.

State Board Examinations

ARIZONA—Jan. 18-19, 1961, University of Arizona, Tucson, Ariz. Dr. William E. Snodgrass, Secretary, Route 2, Box 373, Glendale, Ariz.

NEW MEXICO—Jan. 20-21, 1961, Santa Fe, N. M. Dr. Edwin J. Smith, Box 4385, Santa Fe, N.M., secretary.

NORTH CAROLINA—Jan. 26-27, 1961. Carolina Hotel, Raleigh, North Carolina. Dr. James I. Cornwell, secretary, P.O. Box 9038, Asheville, N.C.

TEXAS—Jan. 28-29, 1961, Rice Hotel, Houston, Texas. Applications must be received 30 days before examination. Dr. T. D. Weaver, Executive Secretary, 207 Capital National Bank Building, Austin 16, Texas.

Deaths

Star indicates member of AVMA

Ord O. Wallace (KCV '16), 72, Osceola, Neb., died June 6, 1960, from cirrhosis of the liver. Dr. Wallace had maintained a general practice at North Bend, Neb., and, since 1939, in Osceola, Neb. He was engaged in poultry inspection for the USDA from 1955 to 1956. He was a member of the Nebraska V.M.A.

Sidney A. Watters (KCV '08), 83, Norman, Okla., died Oct. 12, 1960.

Dr. Watters worked for the USDA for 37 years before he retired.

*Paul A. Weires, Sr. (CVC '17), 70, died Aug. 3, 1960, after a heart attack.

Dr. Weires had practiced in Osage, Clarksville, and Allison, Iowa, before retiring from active practice several years ago. His son, Dr. P. A. Weires, Jr. (ISU '52), is a veterinary practitioner in Allison, Iowa.

Claude P. Wilson (IND '95), 91, Greenfield, Ind., died Sept. 14, 1960.

Dr. Wilson was formerly employed by the Indianapolis stockyards and was the veterinarian for Hancock County.

Women's

Auxiliary

Ready for Campaign Kickoff

Long a helping influence for the AVMA Fellowship program through donations from local fund-raising efforts, the Women's Auxiliary decided last year to intensify and coordinate their contribution campaigns. Since that decision they have built a program which rivals those of professional fundraising organizations. The best way, they reasoned, to raise money was to ask for it in person from the people most interested in the program's objectives — the veterinary profession. They will attempt to contact more than 15,000 members of the profession

— most of them personally. Their goal: \$75,000.

To achieve this end, the Auxiliary has set up an organization modeled on other intensive national campaigns. Twelve directors coordinate the activities of state and provincial chairmen in areas which correspond to the AVMA's 12 Executive Board Districts. The state chairmen, in turn, supply campaign materials to Auxiliary members in their areas for use in the fund solicitation drive.

The AVMA has furnished the tools to be

used in the drive. Each woman will be supplied with a fund solicitor's kit containing donor prospect cards, information on the Fellowship Program, and instructions on how to use the materials. State chairmen are now assembling these kits for mailing to members of the Auxiliary. The donor prospect card is a specially designed IBM card bearing the name and address of veterinarians, along with space for a contribution or pledge for contribution. Utilizing prospect cards sent to her along with a roster of Auxiliary members in her area. the state chairman can assign prospects to women who reside near the veterinarians. The chairman then inserts prospect cards into solicitor's kits and mails the package to the proper Auxiliary member.

When women receive the kits, they are ready to start their work. By personally contacting each of her prospects, she will tell the story of the AVMA Research Fund. Contributions received will then be for-

warded to the AVMA and a receipt furnished to the contributor. In addition, each state chairman will keep a record of the contributions received for award purposes.

The prospect card for veterinarians who cannot be reached will be collected at the end of the campaign and a direct-mail program will be designed to contact them.

At the close of the campaign, states or provinces whose work has brought the highest percentage of returns will be recognized by an award from the AVMA.

The Auxiliary, given the challenge only six months ago, has built a sound campaign structure for aiding the finances of the AVMA Research Fund. The success of the campaign now lies in the willingness of the individual Auxiliary member to learn and to tell the story of the Fund and in the generosity of the profession.

District directors and state chairmen for the AVMA Research Fund-Raising Campaign are:

District I Mrs. C. E. DeCamp, Director Scarsdale, New York STATE CHAIRMEN Mrs. Vincent Peppe

Canaan, Connecticut
Mrs. Alfred Coombs
Skowhegan, Maine
Mrs. Edgar W. Tucker
Concord, Massachusetts
Mrs. Charles F. Bent
Nashua, New Hampshire
Mrs. Charles E. Fletcher
New York, New York
Mrs. Rahpl Povar
Rumford, Rhode Island
Mrs. David Baldwin
Putney, Vermont

District II Mrs. E. L. Symington, Director Newark, Delaware

STATE CHAIRMEN Mrs. George Rosenberger Willmington, Delaware Mrs. J. Walter Hastings, Jr.

Cambridge, Maryland Mrs. Robert Shomer Englewood, New Jersey Mrs. Kenneth Moist York, Pennsylvania Mrs. Lewis Springer Dublin, Virginia

District III Mrs. Mark W. Emmel, Director Gainesville, Florida STATE CHAIRMEN
Mrs. Thomas M. Miller
Dothan, Alabama
Mrs. Peter Roy
Jacksonville, Florida
Mrs. Joel T. Hart
LaGrange, Georgia
Mrs. Don R. Bowers
Brookhaven, Mississippi
Mrs. Fred Coates
Reidsville, North Carolina
Mrs. H. L. Sutherland
Union, South Carolina
Mrs. W. C. Cook
Knoxville, Tennessee

District IV Mrs. H. H. Sutton, Director Georgetown, Kentucky

STATE CHAIRMEN Mrs. Howard White Lexington, Kentucky Mrs. William Mackie Lapeer, Michigan Mrs. Donald Mossbarger Bloomingburg, Ohio Mrs. Victor Miller Charleston, West Virginia

District V Mrs. W. G. Magrane, Director Osceola, Indiana

STATE CHAIRMEN Mrs. E. C. Hannan Maple Park, Illinois Mrs. Howard Glass Indianapolis, Indiana Mrs. Daniel Paradee Hustisford, Wisconsin District VI Mrs. C. H. Wetter, Director Princeton, Minnesota STATE CHAIRMEN

STATE CHAIRMEN
Mrs. C. D. Lee
Ames, Iowa
Mrs. O. B. Gochnauer
Minneapolis, Minnesota

District VII Mrs. R. E. Bogue, Director Wichita, Kansas

STATE CHAIRMEN Mrs. George R. Watson Kingman, Kansas Mrs. Paul Spencer Jefferson City, Missouri Mrs. R. S. Todd Tulsa, Oklahoma

District VIII Mrs. A. C. Sears, Director Fort Worth, Texas

STATE CHAIRMEN Mrs. J. B. Roberts Booneville, Arkansas Mrs. D. McGhee Amite, Louisiana Mrs. Earl D. Waddell Houston, Texas

District IX Mrs. Harry W. Johnson, Director Littleton, Colorado

STATE CHAIRMEN Mrs. Linn S. Poley Denver, Colorado Mrs. C. B. Schwab Fairbury, Nebraska Mrs. Earl Leslie
Alamogordo, New Mexico
Mrs. Dean E. Flagg
Bismarck, North Dakota
Mrs. D. F. Rigo
Menno, South Dakota
Mrs. Jay W. Call
Logan, Utah
Mrs. Bert Reinow
Pinedale, Wyoming

District X Dr. Etnestine Payen, Director Sacramento, California

STATE CHAIRMEN
Mrs. R. E. Reed
Tucson, Arizona
Mrs. Margaret M. Cope
San Pablo, California
Mrs. Howard H. Farumoto
Honolulu, Hawaii
Mrs. E. H. Stodfmeister
Reno, Nevada

District XI Mrs. I. W. Vinsel, Director Dillon, Montana

STATE CHAIRMEN Mrs. James Bailey Moscow, Idaho Mrs. Robert J. Miser Conrad, Montana Mrs. D. H. Jones Roseburg, Oregon Mrs. Howard Bean Seattle, Washington

District XII Mrs. W. G. Stevenson, Director Eden Mills. Ontario

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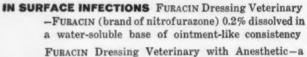
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- IN EAR INFECTIONS FURAGIN Ear Solution Veterinary

 -an anhydrous hygroscopic, water-soluble liquid composed of FURACIN 0.2% and polyethylene glycol.
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WHAT IS YOUR DIGGIGAL!

Make your diagnosis from the picture below—then turn the page



Fig. 1—Radiograph, ventrodorsal view of the pelvis, hip joint, and upper part of the femure of dog, taken after euthanasia and after the muscles had been dissected away.

History.—A male German Shepherd Dog, 5 years old, was used by the U.S. Air Force for sentry duty. The dog's health and performance records were excellent. However, the handler reported that for the past several weeks the dog became excessivly fatigued after he had worked for about 2 hours. He was reluctant to sit, and shifted his weight to his front legs when he walked; he also had difficulty climbing a ladder on the obstacle course. Radiographs of the hindquarters were requested. When the dog was anesthetized for radiography, it was found impossible to extend fully or position the hindlegs properly. The dog did not respond to treatment and was euthanatized. A radiograph (fig. 1) was taken after euthanasia and dissection of the pelvic muscles.

Here Is the Diagnosis

(Continued from preceding page)

Diagnosis.—Irreversible osteoarthritis (chronic degenerative arthritis) of the coxofemoral joints.

B B A FI P94 7211
29 JUL60 M2

Fig. 2—Radiograph of the dog's pelvic bones and femure showing (A) esteophyte formation, (B) eburnation of the femoral heads, (C) shortening and thickening of the femoral necks, and (D) shadows from the thickened capsule.

Comment.—The occurrence of irreversible osteoarthritis (chronic degenerative arthritis) of the coxofemoral joints, when it occurs, is a serious hindrance to the performance of a sentry dog. It is estimated that premature retirement of sentry dogs because of this ailment cost the Armed Forces at least \$20,000 in 1959.

Dogs procured for sentry training are carefully screened for sound joints. Dogs with grades 2, 3, and 4 hip dysplasia are easily detected and are rejected. From experience, it has been shown that it is often difficult to distinguish between the normal,

near normal, and grade 1 dysplastic hip joints.

It is now believed that the slightest malposition of either the male or female portion of the joint initiates an exaggerated form of use-destruction to the joint surfaces which leads to degenerative changes in the cartilage. In the dog described (fig. 1, 2, and 3), the joint capsules were so thickened that the anterior-posterior movements of the femurs were limited to less than 45

Continued on adv. p. 32

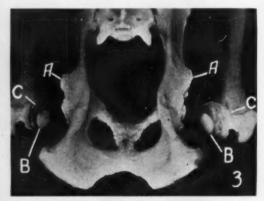


Fig. 3—In photograph of the pelvic bones and upper portion of the femurs, there are (A) excestosis and osteophyte formation, (B) eburnation of the heads of the femurs, and (C) shortening and thickening of the femoral necks.

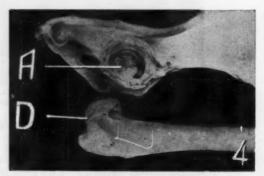


Fig. 4—Radiograph of the right acetabulum showing the fossa (A) filled with esteophytic deposits and upper portion of the right femur with short, thick neck (D).

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Bull, W. S.: N. Am. Vet. 38:3 (Jan.) 1957.

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ALCON LABORATORIES, INC.

Veterinary Division

P. O. Box 1959, Fort Worth 1, Texas

Here is the Diagnosis

(Continued from adv. p. 30)

degrees on either leg. In normal joints, when the muscles are dissected away, the femurs can be moved a full 180 degrees from anterior to posterior positions.

On radiographic examination (fig. 2 and 3), there was osteophyte formation at the lips of the acetabulum and the neck of the femur (A). Also, part of the head of the femur was worn away (eburnation) (B) and neck and head had become shortened and thickened (C). Shadows of the thickened capsule are also seen (D).

Photographs of an acetabulum and femurs show the osteophyte formation (fig. 3 and 4, A-B-C) and the short, thick necks of the femurs (D). Also notice that the fossa of the acetabulum (fig. 4A) is filled with osteophytic material.

This report was submitted by David C. Van Sickle, Captain, U.S.A.F., V.C., chief of Veterinary Services, 802nd Medical Group, Schilling AFB, Kansas. Dr. Van Sickle is now in practice at Shannon, Ill. The report was prepared with the assistance of Wayne H. Riser, D.V.M., M.S., Kensington, Md.

Hess & Clark Names Two Veterinarians to Research Staff

Drs. William M. Dillard and G. Neal Hill have been appointed to the research staff of Hess & Clark, Ashland, Ohio.

In his new position as assistant director of field research, Dr. Dillard (AUB '48) will assist in planning and supervising research conducted at universities and state agricultural experiment stations. Prior to joining Hess & Clark he worked as a public health veterinarian. For six years, he was an associate professor at the School of Veterinary Medicine, Alabama Polytechnic Institute. He was also engaged in private practice for five years.

Dr. Hill (CAL '59), who has accepted the post of research veterinarian, will conduct large animal research at the Hess & Clark research center. Prior to joining Hess & Clark he was a practitioner with the Owyhee Veterinarian Clinic, Homedale, Idaho.—Feed-stuffs, Nov. 12, 1960 (65).

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DOSAGE AND ECONOMY: Recommended treatment levels with new SULFABROM SOLUTION are 25-50 cc. per 100 lb. of body weight when injected intravenously and 50 cc. per 100 lb. of body weight when injected intraperitoneally. Cost of treatment per animal is remarkably low—only about 50¢ to \$1.

RESULTS: The following remarks are abstracted from actual clinical investigation reports on the use of SULFABROM SOLUTION on file at the Merck Animal Science Research Department. (1) "Symptome: Recently shipped-in cow. Temperature 106°. Labored breathing. Rales audible over chest area. Diagnosis: Pneumonia (shipping fever complex). Treatment: 700 cc. SULFABROM SOLUTION in one dose daily for two days. Sixty grams of SULFABROM BOLUSES given at time of I. V. injection. Results: Temperature returned to normal in 24 hours". (2) "Symptoms: Dystocia with removal by forced extraction of putrefied

fetus. Temperature 104°. Rapid pulse and breathing. Anorexia. Diagnosis: Metritis. Trealment: Two doses SULFABROM SOLUTION 700 cc. each. Results: Temperature 101.6° in 24 hours. Appetite returning". (3) "Symploms: Foul hoof—limited to 'between the toes' variety with swelling. Diagnosis: Foot rot. Treatment: 700 cc. SULFABROM SOLUTION. Results: Eight of 11 animals walked normally in 48 hours with swelling reduced to normal or near normal. Three animals required second treatment and returned to normal in 48 hours".

These quoted reports are typical of those being received from clinical investigators and veterinarians. We believe they demonstrate that the only sulfas available to you exclusively—new SULFABROM SOLUTION and SULFABROM BOLUSES—are also the most effective you can use.

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History of the AVMA

President J. F. Winchester, at the meeting in Minneapolis, recommended increasing the

requisite for graduation to four years and for Association membership to three years. Together with higher matriculation standards and the selection of men of broad and liberal education for the school faculties: "... the results will be that in the near future all cities will have a veterinary health officer acting with the medical officers of health in controlling and preventing diseases; the public will cease to look upon the veterinarians as mere animal physicians and surgeons and will grant them the privilege of interpreting and administering laws relating to public health."

Among his recommendations was a "Veterinarians' Mutual Aid Society, . . . to assist members of the veterinary profession, their widows and orphans. . . ." The matter of an insurance program had been discussed earlier in the Review: "It is not infrequent that in a business rated by insurance people as 'extrahazardous,' that a veterinarian is disabled for weeks and even months by an accident which incapacitates him for any duty; or by disease, the result of infection from a patient, or through the natural penalties of human existence; or in case such accident or disease is sufficiently severe to terminate his life, then the question of the means for immediate necessities imposes itself upon him or those whom he may leave helpless behind him." After a long, latent period, the AVMA Group Insurance Trust was established in 1957, perhaps due to President Winchester's recommendation.

In a paper on "The Legitimate Field of the AVMA," Roscoe R. Bell noted the opposition of the Pennsylvania V.M.A. to the clinics and "discussions of questions of purely local and narrow interest" at the AVMA meetings, the contention being that these were outside the scope of the AVMA. W. Horace Hoskins had urged elimination of both clinics and clinical papers from AVMA programs, with the substitution of "broader association work along truly national lines."

This would leave little more than "the reading and discussion of papers on state medicine and national legislation," Dr. Bell protested, and "would require expunging of Article II of the Constitution: "The purpose and object of the association are to contribute to the diffusion of true science, and particularly the knowledge of veterinary medicine and surgery."

The deaths of John Faust, the last nongraduate to be admitted (1884); R. J. Saunders, one of the founders; and past-president R. S. Huidekoper, were noted. Sesco Stewart, secretary for seven years, was elected president, John J. Repp was elected secretary, and W. H. Lowe re-elected treasurer.



SESCO STEWART, D.V.M., was born in Ontario, March 23, 1855, but moved to the United States while quite young and called Pennsylvania his home state. In 1878 he obtained the M.D. degree from Wooster University and entered medical practice in Iowa. In 1885 he was graduated from the veterinary college at Iowa State. Dr. Stewart practiced veterinary medicine until 1892 when he entered meat inspection at Kansas City. Here he became interested in the Kansas City Veterinary College, and, as president, led the move to reorganize it in 1895. A year later he became secretary-treasurer of the college until his death on Feb. 7, 1918.

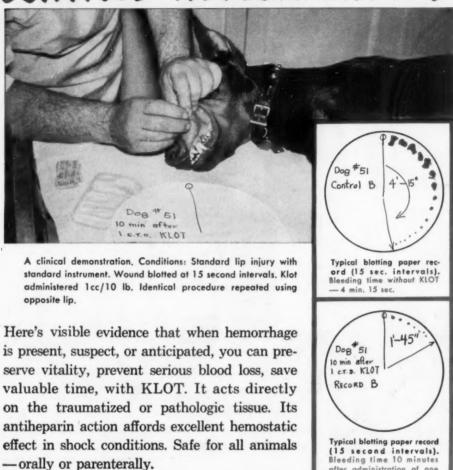
Dr. Stewart was president of the Iowa V.M.A. in 1886 and secretary from 1887 to 1892. He was a charter member of the Missouri Valley Veterinary Association and its president twice. He was secretary of the AVMA from 1895 to 1902 and president from 1902 to 1903. Upon his death, W. H. Hoskins said of him, "He seemed to have died too soon. His work was not finished."





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Quiz for Quidnuncs

- What rapid and simple technique has been employed on a practical basis for diagnosis of pig anemia? Page 60.
- 2. What manner of presentation at AVMA conventions was found by survey to be most popular? Page 62.
 - 3. How is Q Fever in cattle diagnosed? Page 64.
- 4. Initiation of what practice has been primarily responsible for the recent decline in trichinosis in man and swine? Page 69.
- 5. Of what value are injections of iron for combating anemia in hookworm-infected dogs? Page 96.
- What unusual sequela was encountered in a bitch with uterine torsion? Page 98.

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The Infectious Diseases of Domestic Animals

With Special Reference to Etiology, Diagnosis, and Biologic Therapy

BY W. A. HAGAN, D.V.M., D.Sc. AND D. W. BRUNER, D.V.M., Ph.D.

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Campaign Underway to Promote Veterinary Services

A five-way campaign of public education, encouraging animal owners to make greater use of their veterinarians' services, will be continued nationally in 1961 by American Foundation for Animal Health, according to announcement this week by companies sponsoring the effort.

The campaign will be underwritten by member companies of Associated Veterinary Laboratories. It will be a coast-to-coast project and will continue throughout the year in media calculated to reach animal owners at their own local level.

Highlights of special interest to veterinarians include farm magazine, daily newspaper, and weekly newspaper articles, and television and radio publicity.

All this activity will seek to do two things, first, to make the animal owner more conscious of disease problems and the losses they can cost him, and second, to stress the importance of calling a veterinarian promptly on all animal health matters, and relying on the veterinarian as the best way to guard livestock profits.

Trade and Consumer advertising soon will appear in livestock publications on a coordinated program to systematize disease prevention.

The role of the veterinarian as an indispensable team member in such a program will be highlighted.

Livestock and Industry people will be told over and over that the veterinarian is essential in any program aimed at better livestock health. You are the key man.

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COUNCIL REPORT

AVMA Council on Veterinary Service

A Memorandum of Understanding for Humane Organizations and Veterinarians

A "Memorandum of Understanding for Humane Organizations and Veterinarians" was accepted by the AVMA Council on Veterinary Services October 10 and 11. The Committee on Humane Association-Veterinary Relations, authors of the Memorandum, urged that it be published in AVMA and regional publications, and that copies sent to each organized entity of the veterinary profession and to the American Humane Association for distribution. The Memorandum, printed in full, follows.

The American Veterinary Medical Association and humane organizations exist by right of public approval, legal authorization, and from necessity. Each has its appointed task in the field of animal welfare: the veterinarian diagnosing and prescribing for, treating, and conserving the life and wellbeing of animals; humane societies working for the protection, relief, and comfort of animals from the humane standpoint. The veterinary profession and the humane organizations have much in common and at all times there should exist between them the closest cooperation.

As a basis of agreement, the following revised articles are advanced:

- There should exist at all times the heartiest and most loyal cooperation between veterinarians and humane organizations.
- Humane organizations should endeavor, in the building of their work, to avoid conflict with the development and professional activities of the veterinary profession.
- 3. Humane organizations should continue to emphasize the importance of the proper care and humane treatment of all animals; in localities where neither the veterinary profession nor humane organizations are able to provide proper facilities, the stimulation of an exchange of counsel between the veterinarians and the humane organization in each community is desirable in an endeavor to work cooperatively for the better treatment, care, and condition of animals in that district.
- 4. In each community where there is a humane organization, there should be developed a joint council to which grievances on the part of either the veterinarian or the humane society may be referred for consideration and friendly adjustment.

- 5. Humane organizations should use their influence, through the advice of their officers and through their published literature, to urge the public to avail themselves of the services of qualified veterinarians in all matters requiring professional skill or knowledge and, as far as possible, the organizations should encourage and cooperate with state and national veterinary medical associations.
- 6. There should be incorporated into the curricula of the veterinary colleges correlated instruction in the humane care and treatment of animals, an exposition of the duties and responsibilities of humane societies in the enforcement of the law against cruelty to animals, and the importance of an early development of a close bond of fellowship between such organizations and the veterinary profession.
- 7. Existing humane organization veterinary facilities, under the supervision of qualified, licensed veterinarians, offer an exceptional opportunity for training and furthering the work of the veterinary profession. It should be the policy of such an organization to offer its facilities to all licensed veterinarians on an equitable basis.
- 8. The widespread development of well-equipped private animal hospitals throughout the United States offers an exceptional opportunity for providing charitable veterinary services through mutual cooperation between the local veterinary associations and local humane organizations.

The Committee urged humane societies to establish trust funds under the administration of a foundation to help finance veterinary medical care for needy animals. This would eliminate the need for expensive humane society animal care centers, since existing animal hospitals would be willing to cooperate in this program. Veterinarians would provide professional services on a negotiated basis in keeping with the fees of the community. Cost of housing, food, drugs, etc. would be paid by the foundation.

The Committee suggested that the AVMA arrange for the production of a film, "Technique of Ovario-hysterectomy in the Dog." This film would depict the entire operation from the time the dog enters

the hospital until it is released. After seeing the equipment, time, and skill required for such an operation, officials of humane societies and allied organizations would have a better understanding of the implications of a so-called "free spay."

Sire health and management in the artificial insemination industry were sharply criticized in a special report by Dr. David E. Bartlett. The report, as follows, was accepted by the Council.

- Current practices in the artificial insemination industry, as presented to the public, are of uniformly high standard. Speakers within the artificial insemination industry sincerely believe this to be the true situation.
- Actually, compliance with the AVMA-NAAB Code of minimum standards for health of bulls used in artificial insemination has been revealed by an NAAB conducted survey to be deplorably low.
- The present practices in regard to bull health within the artificial insemination industry constitute reason for distress to the AVMA and acute embarrassment to the NAAB.
- 4. It seems reasonable that the concept of the AVMA-NAAB Code of minimum standards for health of bulls in artificial insemination should either be renounced and abandoned

- or re-established upon a basis that is truly effective and which precludes misuse.
- The AVMA-NAAB Code, if not abandoned, should be recognized by the AVMA as in need of updating and technical revision.

In other action, the Council discussed plans for organizing a panel to establish standards for criteria of diagnosis of hip dysplasia.

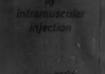
Dr. F. T. Candlin was elected chairman of the Council and Dr. C. J. Parshall, vice-chairman. Dr. C. L. Nelson was elected secretary.

The committees of the Council were reorganized as follows: Committee on Federal, State, and Municipal Veterinarians' Liaison, Drs. Peck, Henderson, and Nelson; Committee on Veterinary Economics and Surveys, Drs. McAuliff, Peck, and Misener; Committee on Allied Organizations, Drs. Parshall, Candlin, and Hill; Committee on Organizational Problems and AVMA Sectional Development, Drs. Jackson, Whittington, and Nelson; Committee on Biological and Pharmaceutical Supply Problems, Drs. Misener, McAuliff, and Henderson, and Committee on Special Veterinary Medical Problems, Pet Insurance, and Dog Food, Drs. Whittington, Parshall, and Jackson.

The next meeting of the Council will be held in March.



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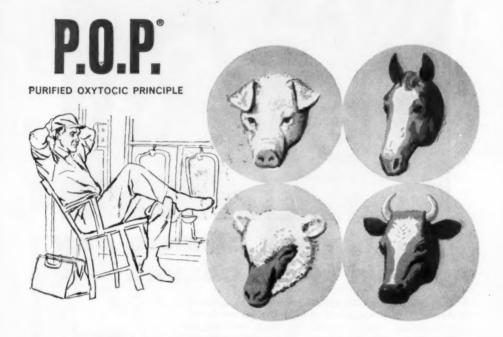
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Magnesium H	łydi	OX	ide								225	gr.
Tartar Emetic						. ,					10	gr.
Gentian Extra	ct										. 5	gr.
Sodium Thio:	sulf	ate	A	In	hy	dr	ou	8	0		32	gr.
Cobalt											0.5	gr.
Nux Vomica	Extr	ac	t								. 4	gr.
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Vitamin D ₂								1	.000	U.
Manganese Sulfate									. 5	gr.
Magnesium Sulfate									. 5	gr.
Ferrous Fumerate										
Calcium Phosphate	1	IIC	ba	si	c				. 5	gr.
Lactalbuminate Nut	ri	en	t						25	ar.
Viable Ruminal Org										-

not less than 200 billion.

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ready to use—no mixing needed.

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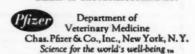




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Coming Meetings

Notices of coming meetings must be received 30 days before date of publication.

January, 1961

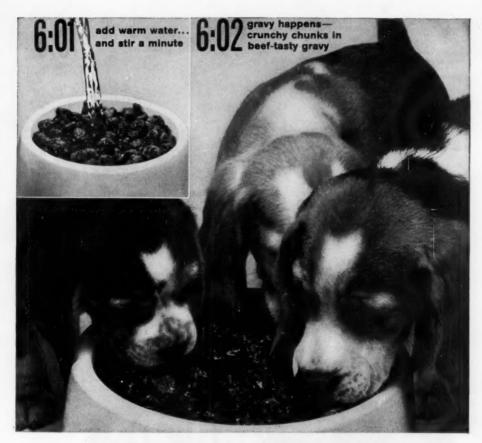
- Pennsylvania University of. Sixty-first annual conference of veterinarians. University of Pennsylvania School of Veterinary Medicine, Jan. 17-18, 1961. Dr. Donald Patterson, School of Veterinary Medicine, University of Pennsylvania, program chairman.
- Nevada State Veterinary Association, Annual meeting. Stardust Hotel, Las Vegas, Nev., Jan. 22-24, 1961. Dr. Murray H. Phillipson, 1720 S. Main St., Las Vegas, Nev., secretary.
- Oklahoma Veterinary Medical Association, Annual meeting, Oklahoma State University, Student Union Bldg., Stillwater, Okla., Jan. 22-24, 1961. Dr. W. D. Speer, 538 S. Madison, Tulsa, Okla., secretary.
- Tennessee Veterinary Medical Association. Annual meeting. Noel Hotel, Nashville, Tenn., Jan. 22-24, 1961. Dr. H. W. Hayes, 5009 Clinton Pike, Knoxville, Tenn., secretary.
- Arkansas Veterinary Medical Association. Annual meeting. Hotel Marion, Little Rock, Ark., Jan. 22-24, 1961. Thayer D. Hendrickson, 7824 Cantrell Rd., Little Rock, Ark., secretary-treasurer.
- Minnesota Veterinary Medical Association. Annual meeting. Leamington Hotel. Minneapolis, Minn., Jan. 23-25, 1961. B. S. Pomeroy, 1443 Raymond Ave., St. Paul 8, Minn., secretary.
- Louisiana State University. Short Course for veterinarians, Pleasant Hall, Louisiana State University campus, Baton Rouge, La., Jan. 24-25, 1961. Dr. R. B. Lank, Department of Veterinary Science. Louisiana State University, chairman.
- North Carolina Veterinary Medical Association. Twentythird annual meeting. North Carolina State College, Raleigh, N.C., Jan. 25-26, 1961. Dr. Edward G. Batte, Veterinary Section, North Carolina State College, School of Agriculture, Raleigh, N.C., head.
- Ontario Veterinary Association. Eighty-seventh annual meeting. Royal York Hotel, Toronto, Ont., Jan. 26-28, 1961. Dr. R. J. Humble, Ontario Veterinary College, Guelph, Ont., chairman.
- Texas Veterinary Medical Association. Annual convention. Rice Hotel, Houston, Jan. 29-31, 1961. Dr. King Gibson, 3906 Lemmon Ave., Dallas, Texas, co-chairman.
- California Veterinary Medical Association. Annual midwinter conference. School of Veterinary Medicine, University of California, Davis, Calif., Jan, 30-Feb. 1, 1961, Mr. Kenneth Humphreys, 3004 16th St., San Francisco, Calif., executive secretary.

February, 1961

- Ohio State Veterinary Medical Association. Annual meeting. Commodore Perry Hotel, Toledo, Ohio, Feb, 5-8, 1961. Dr. R. E. Rebrassier, 1411 West Third Ave., Columbus 12, Ohio, executive secretary.
- Sierra Veterinary Medical Association. Second annual meeting. Mammoth Mountain Inn, Mammoth Lakes, Calif., Feb. 12-17, 1961. Dr. John R. Puckett, 13476 Washington Blvd., Venice, Calif., president.

(Continued on adv. p. 52)

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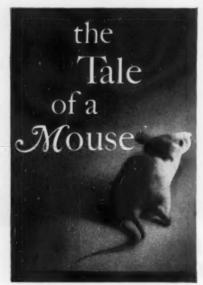
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(Coming Meetings-continued from adv. p. 50)

Missouri Veterinary Medical Association. Sixty-ninth annual meeting. Hotel Statler-Hilton, St. Louis, Mo., Feb. 19-21, 1961. Paul L. Spencer, D.V.M., P.O. Box 283, Jefferson City, Mo., secretary.

Illinois State Veterinary Medical Association. Annual meeting. LaSalle Hotel, Chicago, Ill., Feb. 20-22, 1961. Dr. C. B. Hostetler, 1385 Whitcomb Avenue, Des Plaines, Illinois, executive secretary.

Manitoba Veterinary Medical Association. Winnipeg. Manitoba, Feb. 27-28, 1961. Dr. K. Warren, Killorney, Manitoba, secretary.



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March, 1961

Alabama Veterinary Medical Association. Annual meeting. Whitley Hotel, Montgomery, Ala., March 19-21, 1961. Dr. M. K. Heath, School of Veterinary Medicine, Auburn, Ala., secretary.

April, 1961

Southwestern Conference on Diseases in Nature Transmissible to Man. Eleventh annual conference Agricultural and Mechanical College of Texas, Memorial Student Center, College Station, Texas, April 27-28, 1961. Dr. F. P. Jaggi, Jr., Department of Veterinary Public Health, Agricultural and Mechanical College of Texas, College Station, Texas, conference chairman.

August, 1961

American Veterinary Medical Association. Ninety-eighth annual meeting. Sheraton-Cadillac Hotel, Detroit, Mich., Aug. 21-24, 1961. Dr. H. E. Kingman, Jr., 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Foreign Meetings

Fourth International Congress on Animal Reproduction. The Hague, Netherlands, June 5-9, 1961. For additional information contact: the Secretariat of the Fourth International Congress on Animal Reproduction, 14, Burgemeester de Monchyplein, The Hague, Netherlands, Dr. L. Hoedemaker, secretary to the organizing committee.

Eighth International Congress of Animal Husbandry. Hamburg, Germany, June 13, 1961.

Twelfth World's Poultry Congress. Show Grounds of the New South Wales Royal Agricultural Society, Sydney, Australia, Aug. 13-18, 1962. Dr. Cliff D. Carpenter, chairman, U.S. Participation Committee, 1207 Emerald Bay, Laguna Beach, Calif.; Dr. A. William Jasper, secretary, c/o AFBF, 2300 Merchandise Mart, Chicago 54, Ill.

Dr. R. G. Brown Appointed Manager of Cyanamid's Field Development

Dr. Ross G. Brown has been appointed manager of the field development group for American Cyanamid Company's Agricultural Division. He succeeds Dr. William P. John-

Dr. Brown joined Cyanamid in 1954 as head of the veterinary investigation laboratory and since 1956 has served as head of the clinical development laboratory for the Agricultural Division.

He received his D.V.M. degree from Michigan State University and his undergraduate degree from the University of Missouri.

Before joining Cyanamid, Dr. Brown was a professor in the veterinary pathology department at the experiment station, Lexington, Ky.

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Dr. M. A. Schooley Joins Shell Chemical

Dr. M. A. Schooley (KSU '38) has joined the agricultural chemical division of Shell Chemical Company.

Before joining Shell, Dr. Schooley was director of animal health and nutrition for Armour and Company, Chicago, Ill.

Instructions to Authors

JOURNAL of the AVMA

1) Exclusive Publication: Articles submitted for publication in the JOURNAL of the AVMA are accepted with the understanding that they are not being offered for publication elsewhere.

2) Manuscripts, including footnotes, references, tables, and legends, must be typewritten, double-spaced, on 8½- by 11-inch bond paper, and the original and one carbon copy should be submitted. One-inch margins should be allowed on the sides with 2-inch margins at the top and bottom. Articles should be concise.

Purpose of the article should be stated in the introduction. Summary should be included.

3) References to published works should be brief and limited strictly to what is relevant to satisfactory exposition of the author's own work. Reference names are not permitted in the text of the article. Persons cited are to be referred to by superscript numbers only, relating to the reference list at the end of the article.

References should be typed double-space, in alphabetical order by author, as follows: author(s),

title, periodical name, volume, year, and page(s).

³Mansson, J., and Obel, N.: The Technique of Adrenalectomy in the Ruminant. Cornell Vet., 48, (1958): 197-201.

When books are cited, name of publisher, location, edition, year of publication, and pages concerned should be given.

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4) Tradenames of products are avoided in the text of the article. Use only generic or chemical names. The tradename may be included in a footnote along with name and location of producer (composition of product may be included if necessary): e.g., "... piperazine citrate*..." Footnote: "Piperol, Carson Chemicals, New Castle, Ind.

5) Arabic numerals should be used wherever digits are needed throughout the article except at the beginning of a sentence.

6) Abbreviations for weights and measures as given in standard dictionaries are usually acceptable, but some are determined by AVMA editorial preferences: e.g., Gm., gr., kg., cc., mg., cmm., Gm./kg., μg., mg./100 ml. Other abbreviations should be explained the first time they are mentioned either in parentheses or footnotes: e.g., "... pregnant mare's serum gonadotrophin (PMSC)..."

7) Photographs should be furnished in glossy prints. Identifying arrows, letters, etc. within photographs should be clearly defined. All illustrations should bear the author's name, illustration number, and "top" side indication.

8) Drawings, graphs, and charts should be clear and large enough to allow for possible reduction in size. A glossy print should be submitted if possible.

 Tables should be simple and typed doublespace. Complex tables are not acceptable. Complex material should be summarized rather than tabulated.

10) Legends should be typed double-space on a separate sheet.

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Wanted—veterinarian for staff of large, modern institutional hospital for small animals in New York City. Excellent experience and research potential for enthusiastic person. License required. Address Box A 50, JOURNAL of the AVMA.

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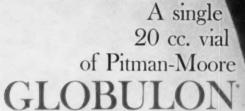
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Alcon Laboratories	Ruminoc and Rumatone 47
Isopto Cetamide	Norden Laboratories
American Cyanamid Co	Pragmatar
Armour Pharmaceutical Co.	Parke-Davis and Company
Kymar Ointment	Benylin Expectorant 27
P.O.P. 43	Parlam Corporation
Colorado Serum Co.	Sebumsol 20
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Corn States Laboratories	Mastalone 10, 11
Tempacine	Liquamycin Injectable
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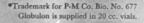


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